The New York State

Conservationist

August-September 1958

State of New York Conservation Department

THE COMMON SKUNK (See Page 4)

Who Needs It?

A while ago we hitchhiked a ride with the mail—that is to say, we posted CONSERVATIONIST advertising flyers with some thousands of small game take questionnaires being sent out by the Department's Bureau of Game. This, we thought, was a good idea. It cost no more postage for the game take questionnaires than without the flyers and gave us an opportunity to bring to the attention of a great many —who ought to be particularly interested in our natural resources—the knowledge that their Conservation Department publishes a magazine for conservationists.

"Well, that's just dandy," we hear you say, "and so what?" The "so what" in this case was supplied by a Westchester County friend who, upon receipt of our subscription form, mailed it right back with, as the old song goes, these words written on—"*Dear Sir: A very nice little magazine, but who needs it?* Field and Stream, Outdoor Life, *etc. do a good job. Let's have more fish, more hatcheries, more public stream rights—who needs literature?*"

Now this is a real change of pace. We get thousands of letters on just about as many subjects, and a good many of the people who write take time out to tell us that THE CONSERVATIONIST "suits them fine," "best of its kind," "read it from cover to cover"—etc., etc. Naturally, such comments fall on willing ears; spur us on to keep the magazine up to par. However, a straight diet of back pats leads right down the road to complacency—a most unhealthy destination.

So, honest criticism is a welcome change and that, we have no doubt, is what our Westchester friend intended. Note that we say honest; not constructive. Our critic is firing all right but he is off target; he doesn't have the range. We quite agree, for example, that *Field and Stream* and *Outdoor Life* are doing a good job. But it is apparent, we think, that we are "playing in different leagues." These sportsmen's magazines are published for hunters and fishermen primarily, and the measure of their success depends largely upon their ability to entertain their readers. THE CONSERVATIONIST is published for hunters and fishermen too—but not primarily. We depend equally upon farmers and teachers, mechanics, housewives, school children, lawyers, doctors—in short, everyone, for we are all vitally affected by the way we manage *all* our natural resources.

Nor are we writing primarily to entertain, 'though if we can get the story across and in the bargain, make it fun to read, well that's just fine. And if, withall, we can wrap it up with the respectable cloak of "literature"—then "our cup runneth over."—Editor

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AUGUST-SEPTEMBER, 1958

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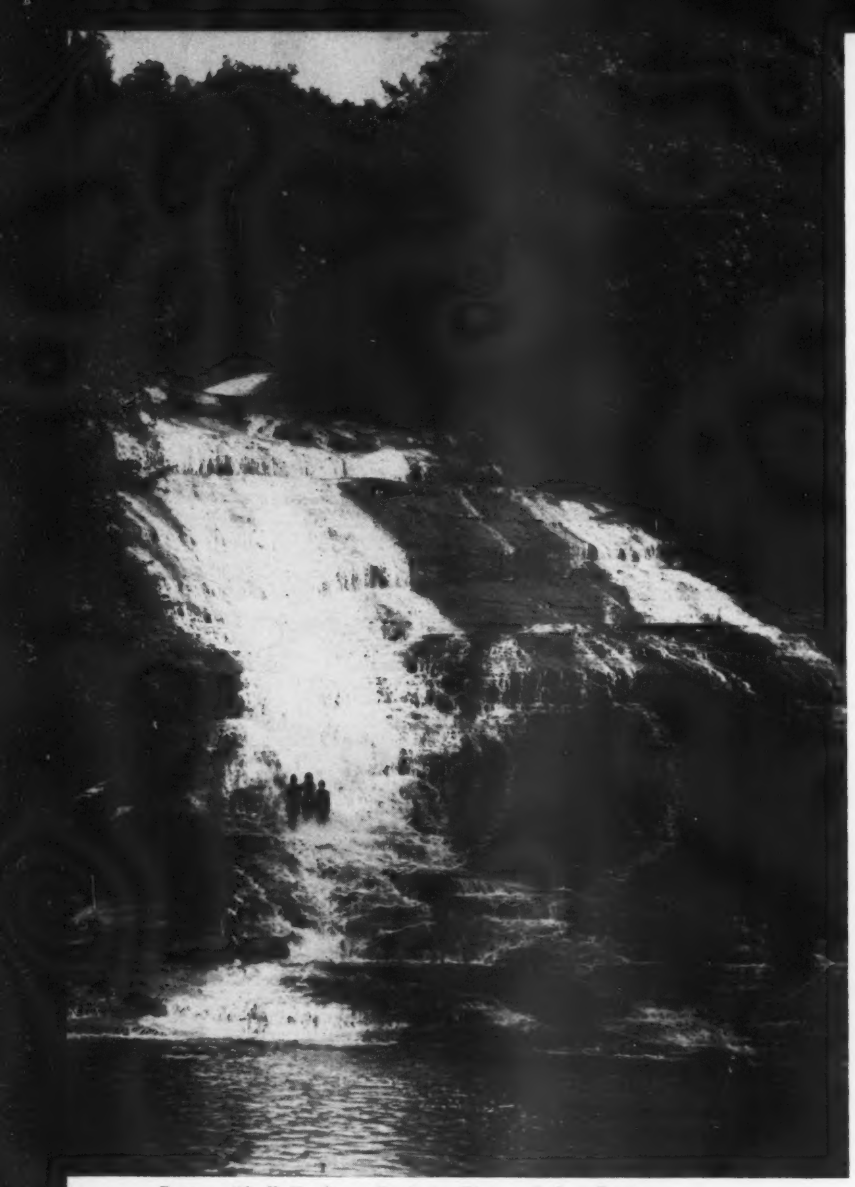
The State Parks

by James F. Evans,
Director of State Parks

Our State park system in New York is as fine as any in the land. Its variety is endless — from remote unspoiled wilderness areas to beach playgrounds —serving millions of citizens. The great scope and detail of the system is perhaps, by paradox, its only disadvantage, for many of our own citizens do not fully appreciate the vast recreational potential in our State parks.

Not merely as Governor, but recalling many enjoyable and fruitful years as a regional park Commissioner, I am pleased to introduce this series of articles in THE CONSERVATIONIST *on State parks.—* Averell Harriman



Buttermilk Falls State Park in Finger Lakes Region

Bathers at Jones Beach State Park

THE State Council of Parks was created thirty-four years ago; its purpose to speed and facilitate the formation of a unified, comprehensive State park system. Prior to that time, a few scattered areas, largely of scenic, historic or geological interest, had been set aside by ambitious but unrelated local agencies. These were administered by all sorts of special commissions and boards without central control or common objectives.

In the Lower Hudson Valley area, through the generosity of the family of Governor Harriman and other public-minded citizens, a fine start had been made on what is now the Palisades Interstate Park. But as late as 1924, when the State park plan was initiated, there were no parks at all on the east side of the Hudson. Long Island had only a scant 200 acres in a small, ocean-front State park on Fire Island and the present Taconic and Long Island regions did not exist. In that year (1924), however, Robert Moses (then Secretary of the New York State Association), enlisted the support and enthusiasm of Governor Alfred E. Smith for a "State Park Plan." Largely through their efforts, the statutory and administrative basis of the New York State park system came into existence.

The State park system was seen in terms of broad principles and reachable objectives. You will find in the early record of the State Council of Parks no learned treatises on land use or lost frontiers, no magic formulae for spacing or sizing parks by population, median incomes or annual rainfall. Rather, you will find in the first report of the State Council of Parks, published in 1925, a clear statement of the needs and objectives of a State park plan that are worth quoting today:

"A State park plan must take into consideration the topography of the State, the location of population centers, the anticipated growth in population, the anticipated need of recreational and conservation facilities in the light of the growth in population, particularly urban population and of the ever increasing demand for outdoor recreation. The plan must be made with the automobile in view and with air travel on the not distant horizon. It must take into consideration the location of forest, lake and water areas, areas of farming, industry, trade and commerce, railroad and traffic

ks of New York

Thirty million people can't be wrong! They all visited our State Parks last year and they'll be back this year—bringing more folks with them.

Regionally administered across the State, there are now 82 parks in the system, aggregating some 200,000 acres.

In future issues of THE CONSERVATIONIST *we will take you on a pictorial park tour—region by region. Here, 'though, in an introduction by the Director of State Parks, is an account of how and when it all started.—Editor*

arteries. Careful consideration must also be given to the disappearance of shore front and other desirable recreation areas into private hands and the need of securing sufficient areas of this kind at reasonable prices before they are developed, built upon and otherwise removed from the possibility of acquisition."

These same principles and objectives were embodied in the original enabling legislation as powers and duties of the State Council of Parks. The language of the statute remains substantially unchanged to this day.

The prime feature of this plan was the division of the State into a number of park regions, each headed by a local Commission of three to seven members. The members are appointed by the Governor, subject to Senate confirmation, for long overlapping terms and receive no salary. Each Commission elects its own presiding officer, and these Chairmen, by statute, comprise the State Council of Parks. Every county in the State is in a park region headed by a Commission except the Forest Preserve counties, which are administered directly by the Conservation Department through the Division of Lands and Forests. These Forest Preserve counties form the sixth park region, and the law provides that the Director of the Division of Lands and Forests shall also be a member of the State Council of Parks.

The State Council of Parks provides State-wide co-ordination in matters of planning and policy. To provide unification of administration where necessary, the commissions and Council are placed within a Division of Parks in the Conservation Department.

To insure co-ordinated control in the early days of the State Council of Parks, existing independent commissions were taken into the Council as members. Thus, original members of the Council included the then existing Palisades Park Commission, the Commissioners on the State Reservation at Niagara and the Westchester County Park Commission. Several existing areas were under the Education Department, and therefore, membership by the Director of the State Museum was added. Letchworth Park, administered by a chapter of the American Historic and Scenic Preservation Society, was represented by the President of that Society.

Immediate steps were taken to set up new State park commissions in portions of the State not covered, resulting in the establishment during 1924 and '25 of the Taconic, Central New York, Finger Lakes and Long Island commissions. Gradually, the special purpose and limited area commissions were transformed into true regional State park commissions. In 1931, the Thousand Islands Commission was established. In 1944, sites solely of historic interest were transferred to the Education Department, eliminating further need of membership in the Council by the State Museum. With these steps, the regional coverage became complete.

In parks, as in other public programs, principles are fine, but it is people who produce results. Here the regional commission idea, utilizing the substantial and constantly-renewed interest of park-minded and public-spirited commissioners serving without pay, has worked admirably. The park system now comprises 82 parks, aggregating about 200,000 acres, with an annual attendance of over 30 million and a respected position in the recreational activity of the State and Nation.

Two features have contributed much to this growth. A very important one, recognized early by the State Council of Parks, was the close relation between the parks themselves and proper access to them. This was clearly set forth in the original precepts, so that parkway standards and programs received equal attention with park development from the start. This may seem obvious or routine today, but in 1924 there was only one true parkway in the country, the original Bronx River Parkway in New York City and lower Westchester County. The eventual development of over 200 miles of parkways has not only added essential access and pleasant approaches to the State parks but has had a tremendous impact on the entire economy and development of their suburban areas.

Another feature that has been vital is the careful separation of planning and administration embodied in the park law as a principle and proven in practice. This law clearly establishes a separate channel for planning by the Council, often originating with the regional commissions but unified, balanced and coordinated on a State-wide basis. It insures that paid career employees will have a buffer between them and politics and other pressures. Over all of the system, as a last court of appeal, is the Conservation Commissioner.

Following articles will outline, by regions, some of the unique and salient features of the State park system, including important, recent developments as well as additions still under negotiation, such as the following:

1. On Long Island, a large acreage added to Sunken Meadow State Park by purchase of an adjacent waterfront estate.

2. In the Palisades region, a large recreational area in Rockland County obtained from private gifts matched equally by State appropriations.

3. In the Taconic region, negotiations are underway to transfer to the State the undeveloped portion of Mohansic Park, at present a Westchester County park area.

4. In the Finger Lakes region, a new State park is being established on Seneca Lake by transfer of lands from the City of Geneva.

Negotiations are also underway with the Federal government to obtain for park purposes a large part of the Sampson Air Force Base, now being abandoned by the Air Force.

5. In the St. Lawrence and Niagara regions, large and dramatic additions to the park and parkway system are coming about through the co-operation of the Power Authority of the State of New York.

A fully developed park of some 2,000 acres on Barnhart Island will be turned over to the Thousand Islands State Park Commission when the St. Lawrence power project is complete.

On the Niagara Frontier, a most important section of the Niagara Parkway from the North Grand Island Bridge to Lewiston, fulfilling a long-time dream of a scenic approach to the Falls, will be built by the Power Authority as a part of the power project and turned over to the park system for operation.

The State park system expects to go on with further improvements to keep pace with the growing population and recreational demand of the State, using the same broad and time-tested standards and aiming always at imaginative but limited and attainable objectives.

1. Shells of turtle eggs and hole dug by skunk

2. Nesting holes of bank swallows

3. Holes dug by skunks in plow fur

4. Bee hive visited by skunks

5. Cabbage plant severely damaged by skunks

6 Holes dug by skunks near cabbage plant

7. Skunk work on potatoes

8. Corn damaged by wildlife

9. Bird injury to sweet c

The Common Skunk

by LeRoy C. Stegeman, *State University College of Forestry*

Turtles hate skunks. Know why? Skunks can eat honeybees without getting stung. Know how? And maybe the potatoes you are having for dinner matured because skunks patrolled a farmer's field. Here are some unusual observations on an interesting animal.—Editor

THE common striped skunk is a good natured animal. In man, the skunk sees a benefactor and, with few reservations, is quite willing to strike up a close friendship. Man, however, is a little reticent. He's apt to misinterpret the skunk's "Howdy neighbor" approach as pure aggressiveness, backed up by his famed and potent aromatic artillery. As a consequence, some of the skunk's habits and relationships with other animals and with man, himself, are not well known. We believe you will find these habits and relationships of considerable interest and that, knowing the skunk better, you will answer right back, "And howdy to you, friend."

Frequently skunks take up their abode under barns, houses and other buildings. They usually remain in these hideaways while man is active and venture forth only during the dark or twilight hours. Skunks like such locations because usually there are many insects in the gardens and lawns, sweet corn in season, fruits in abundance on the ground in orchards, berry patches and vineyards, chicken heads and other food scraps in rubbish piles, etc. Because skunks feed upon this wide variety of foods at dusk or at night, man sees little of such activity. Nor does man often see the sign they leave behind—the small round holes in the lawn or pasture where the skunk has dug out a root-destroying grub, the claw mark on the cabbage leaves where a skunk has removed a caterpillar, or where it has eaten a big, juicy tomato worm. Man is more likely to notice signs of damage and often these are wrongly attributed to the skunk. For instance, the farmer sees a skunk feeding on a dead chicken and concludes that the skunk killed the chicken. This may not be true. The skunk is a scavenger as well as a predator, and not very afraid of man. If it finds a dead chicken it may remain at this feast, and the farmer sees it. The kill may have been made by some other animal or by disease. However, the weasel, rat or other predator keeps out of sight and the disease cannot be seen, so the skunk gets the blame. During the past year two farmers have reported finding skunks asleep in the nest with setting hens and neither hen nor eggs harmed,

I am convinced that if the complete story could be told, the skunk would be known as a very beneficial animal. We must admit, though, that there are exceptions to the rule and some individuals do damage.

The Skunk and the Turtle

People, thinking about animals and such, do not normally associate skunks and turtles. Turtles would agree—it's an association they would be most happy to dissolve — for if it weren't for skunks there would be a great many more turtles.

Turtles, as most everyone knows, lay their leathery-shelled eggs in a hole or pit in sandy soil. They cover the eggs with sand and leave them unattended to incubate in the warmth of the sun-heated soil. Now skunks love turtle eggs, and in their amblings along stream banks and fields near water they easily smell out turtle nests, dig out and make short work of the eggs.

Figure 1 shows a typical scene. The turtle eggs are split open and the contents devoured, leaving the leathery shells curled up as shown. The writer has checked many such places and never found a single egg not destroyed. Where turtles and skunks are plentiful, such scenes are very common during June and July.

Careful search of several areas near Oak Orchard revealed an average of over twelve turtle nests destroyed by skunks per acre. These counts were made in June and I would expect still more nests to be destroyed in the same areas later in the season. This represents a heavy loss of young turtles and must have a pronounced effect on the turtle population in the surrounding area.

This relationship of the skunk to the turtles was used by Fisher (1908) to show how easily the balance of nature may be upset. He cites the case of a marshland in northern New York. This marsh was well populated with ducks, rails, snapping turtles, frogs and other aquatic life. The turtles deposited their eggs in abundance in the sand. Skunks feasted upon the eggs, greatly reducing their numbers. Skunk fur became fashionable and valuable. Skunks were largely trapped out. Turtles greatly increased in numbers.

Turtles destroyed many ducklings and other aquatic life. Ducks became scarce. The large number of turtles attracted market hunters, who harvested many turtles. Skunk fur went out of style and their population again built up. Skunks reduced reproduction of remaining turtles. Ducks again increased in numbers. Once again, the marsh became well populated.

Skunks and Clover Seed

The number of skunks in an area may also influence the amount of clover seed a field will produce. In this case a heavy population of skunks destroy most of the bumblebee nests, and since bumblebees are necessary to fertilize the clover, a scarcity of bumblebees means few clover heads fertilized and a light crop of seed. There are many such unexpected relations throughout the animal kingdom.

Skunks and Bank Swallows

An interesting relation between skunks and bank swallows was revealed in several colonies east of Oneida Lake along the shore of Fish Creek and its tributaries. In one location, a large colony of bank swallows had dug their nesting holes in the sandy bank of this stream.

Figure 2 shows part of the colony. Several of the holes were within a foot

or two of the top of the bank. Grain had been planted in the field above the colony. Skunks working along the plow furrow in the overhead field had dug down to the swallow nests and removed the nest materials, eggs, nestlings, and, in a few cases, even the adults.

Figure 3 shows the plow furrow and the holes dug by the skunk. The deepest of these was 21 inches.

Two other colonies were in a pasture where a fairly heavy sod covered the top of the bank. Both of these colonies had suffered losses due to skunks in the same manner as described above.

Fifty-four holes had been dug by skunks and at 41 of these, nesting materials had been removed. Large egg fragments were found occasionally in this nest litter. Pinfeathers or adult feathers were found at 22 holes. Adult feathers were found at seven holes and at one there was part of an adult wing.

In every case the holes dug by skunks extended directly to the nest cavity—they did not have to dig around to find the nest. How the skunks located them so accurately from the top of the bank is unknown. It seems likely that it is through smell and hearing in the same manner in which they locate white grubs several inches below the surface in lawns and fields.

Several other colonies of bank swallows have been visited and no evidence of molestation discovered. The writer believes this is an unusual relationship.

Skunks and Honeybees

In the Fall, after a few frosts, the skunks' supply of insect food is greatly reduced. The animals then have to forage more widely to satisfy their appetite. It is chiefly at this season that skunks invade the bee yard. Their visits are made under cover of darkness, which is much to their advantage. They probably never encounter any great number of bees at a time, and those present are not so active as they would be in the daytime. Two or three beekeepers have described the method of feeding as follows: They pounce upon their prey with both front feet and then with many quick strokes rake it over and over toward themselves, backing up at the same time. As soon as the prey is reduced to a harmless mass it is eaten as a cat would a mouse.

Figure 4 shows the appearance of a hive that has been visited by skunks. Notice how the grass is shredded and raked away from the hive. The floor board is grooved with claw marks and parts of crushed bees are to be found in the grass and on the ground. The same animal will return to the same hive night after night thus weakening the colony.

Notice that the beehive is on the ground. The writer has never found any molestation of a hive where it is placed above the ground on a bench or stand. Skunks are primarily ground feeders. They are easily trapped in such situations and can then be disposed of or can be put in a sack and carried away and released. After such treatment they seldom return.

Skunks, Cabbages and Potatoes

Skunks deserve much credit for digging out the June bug or May beetle in both the larval and adult stages. In one instance this good habit did more harm than good.

On a farm located about one and one-half miles south of Marcellus cabbages and potatoes had been planted on an area which had been covered with a heavy sod for a number of years and was heavily infested with June bugs. As the Summer progressed the grubs congregated around the cabbage plants and the potato hills where the soil was more moist and less disturbed by cultivation. In these places they could also feed on the roots of the plants, especially the young potatoes. As a result the skunks did most of their digging around the cabbages and in the potato hills. Many of the cabbage plants were dug out completely and left to die. *Figure 5* shows a cabbage greatly damaged in that way.

Figure 6 shows fresh skunk workings. Five small holes are evident. These probably represent the removal of five white grubs. In this case the plant would probably profit by the removal of the insects.

Figure 7 shows the results of digging in the potato fields. All of the potatoes dug were damaged to a greater or less extent by white grubs. The cavities eaten in the tubers show clearly. Had the potatoes been undisturbed very few of them would have survived the insect attack. Therefore while many potatoes were dug by skunks most of them would have been destroyed by grubs and the actual loss to the potato crop was not nearly so great as it at first appeared.

Skunks and Corn Damage

Skunks often do considerable damage to sweet corn when it is in the milky stage. Close inspection is necessary to determine which of the many animals that damage corn was responsible. Skunks, raccoons and woodchucks are strong enough to strip the husks from the entire ear. Woodchucks cut the husks smoothly with their gnawing teeth. An example of woodchuck damage is shown in *Figure 8* by the ear at the right. Both raccoons and skunks shred the husks as they pull them away with their pointed canine teeth. Skunks usually make more and finer shreds and limit their damage to the ears near the ground. Thus small corn suffers more from skunks than large corn. Raccoons are larger and stronger and frequently break off an entire ear, often carrying it away. In *Figure 8* the two ears at the left show the typical injury done by skunks.

Birds damage the top end of the ear, shredding the husks back in fine shreds. They then pick the kernels and during the milk stage many of the hulls are left on the cob so that they appear pitted. A typical example of such injury is shown in *Figure 9*.

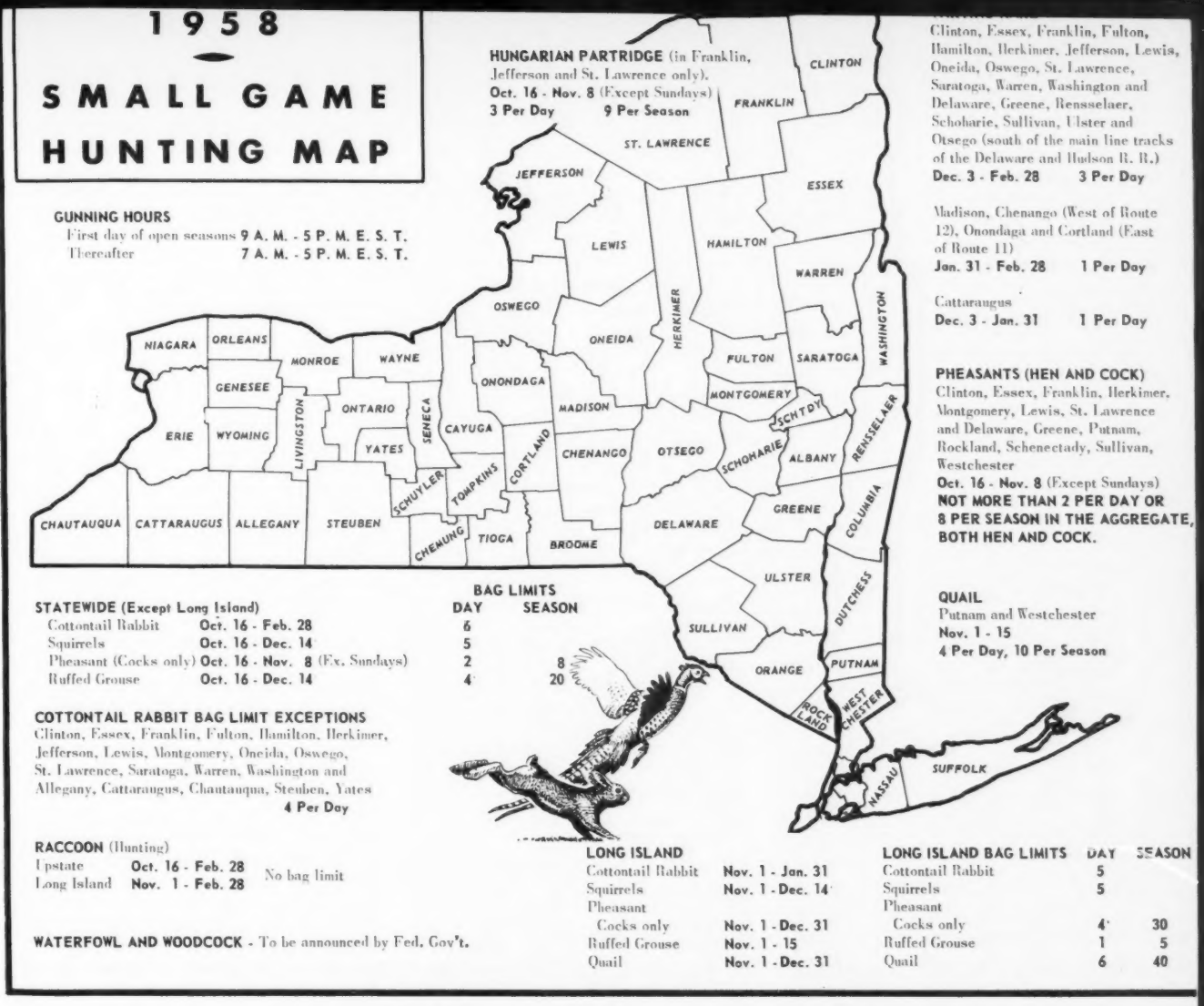
In contrast to bird injury, the mammals take bites which remove entire kernels. In fresh damage you frequently can see the deeper scars of the canine teeth of the raccoon and the skunk.

From these accounts the reader may believe skunks do more damage than good. However, that is not true. The species is definitely more beneficial than harmful. The conditions reported here are the more unusual and those which occur less frequently.

Many investigators have made detailed food studies of skunks and have shown that their principal food is insects and most of the insects taken are injurious to plant life. When fruits are ripe and plentiful, they constitute an important part of skunk diet. Most of these are gathered from the surface of the ground, so represent waste as far as man is concerned. Mice constitute another important food item and their destruction is favorable to man. An occasional bird is taken and not infrequently they were previously injured or already dead when taken by the skunk. Under these circumstances, this too, is a service to man. The feeding habits of the skunks studied by the writer substantiate these favorable findings.

In addition to these services rendered while living, skunk pelts may be an important part of the fur market. At the present time, long-haired fur is in disfavor and the price of a skunk pelt is low. Some years ago, when long-haired fur was in style, a prime black skunk pelt has brought $3 or more. Their distribution in farming communities and around farm buildings has helped many a farmer's son get a little much-needed spending money.

It is the writer's contention that skunks are man's benefactors—in spite of the fact that they do some damage at times. Think it over. Next time a skunk greets you, just say: "And howdy to you, friend."



Small Game Seasons—1958

DURING the Summer most people are concerned with a good place to go swimming or picnicking, but come September many of these same folks will dust off the fowling piece. As the frosts begin to sharpen the air, their thoughts will turn to hunting their favorite small game. They will begin to keep a watchful eye for game sign in their favorite cover.

The Game Manager has been watching carefully all Spring and Summer because this is the period—the nesting and rearing season—that can make the difference between good and poor hunting.

Each Summer the Game Managers give us a report on small game conditions throughout the State; a preview of what the sportsman may expect when the hunting season opens. In a normal year, the Managers can review their records of such things as breeding stock carried over from the past Fall; the over-Winter survival, the Spring breeding and rearing success—and come up with a reasonably accurate forecast of hunting season prospects.

This year when the reports came in (early July) the Managers were frank to admit that abnormal weather conditions during Spring and early Summer had them concerned. Most reported good carry over of breeding stock despite the heavy snows of late Winter. What snarled up most calculations, though, was the extended cold weather and heavy rainfall that was prevalent from April pretty well through the month of June. There is little doubt that it will have a significant affect in lowering the early nesting and rearing success of the three principal ground nesting species — pheasants, grouse and cottontail rabbits.

Nevertheless, most of the Managers were hoping that better weather in late June and July would allow for some renesting and rearing of successful broods to offset probable early losses. So, with fingers crossed, this is the best summary of small game abundance that we can come up with at this early point in the season:

Pheasants.—Prospects fair; variable according to quality of range.

Grouse.—Indications for a fair to good season.

Cottontail rabbits.—Cold wet weather probably hurt early litters but third and fourth litters should offset such losses. Hunting prospects generally thought to be good.

Squirrels.—Prospects good to excellent. This species, because of its off-the-ground nesting habits, is not so susceptible to inclement weather.

—E. A. WESTERVELT

Our Forest Preserve

by Sharon J. Mauhs,
Conservation Commissioner,
State of New Work

Recognizing the vital importance to the people of the State of New York of our Forest Preserve lands in the Adirondack and Catskill Mountains—and aware of the conflict and confusion of statement and philosophy with respect to the administration of this wilderness heritage, I take this opportunity to bring to the readers of THE CONSERVATIONIST, *my firm views on this matter as expressed in my speech before the Oneida Lake Association at its annual meeting in Syracuse, April 23, 1958.—Sharon J. Mauhs, Commissioner*

I appreciate the invitation to be with you tonight and to speak out on a subject that I think deserves plain talk on the part of the Conservation Commissioner of this State.

For some weeks now there has been growing a somewhat curious chorus. The theme of this chorus is admiration for the great Forest Preserve of the Adirondacks and the Catskills, but underlying this theme is a strange proposal. To make this great natural wonderland more beautiful, so they say, and to save the trees, they would cut down and lumber off portions of its great wilderness forests. They say they want to do this to end "sixty-three years of neglect." They propose to bring in what they call "scientific forestry" and "selective cutting," to remove, what they claim is now a "forest cemetery."

I am not impressed by these statements. I am not impressed by this kind of argument. Now, let me say that I have a profound respect for good forest management in its rightful place. What I object to is using such terms as "scientific forestry" and "selective cutting" as a smoke screen to make the public think that you can log portions of the Adirondacks and the Catskills without messing up the woods. I do not want this Department to be made the "goat" when people come to us, after we've supervised a cutting in some old-growth Adirondack hardwood, and say: "So this is what you call forestry! I thought you told us it would be more beautiful when you got through!"

It is true that there is a spotty public land ownership in the Forest Preserve; that the State's holdings are not all in large contiguous blocks of forest growth; that while there are large unbroken blocks of Forest Preserve lands, there are also large numbers of scattered small areas of Forest Preserve which do not contribute to wilderness, and which constitute one of the big problems and one of the big headaches of Forest Preserve administration. This, of course, will be corrected in part as the result of the adoption of the detached parcel amendment last Fall. But this spotty public ownership, as I see it, is not an excuse for lumbering in the Forest Preserve. On the contrary, it is a reason to plan to consolidate our holdings where that should be done, and can be done, when it is feasible, and funds are available, and for setting up in the Forest Preserve counties, outside the Blue Lines, and elsewhere in the State, more reforestation areas where timber production may be appropriately carried out. This would not, and need not, interfere with our wilderness forests.

Now, let us take a look at today's Forest Preserve and, at the same time, a look ahead—to anticipate the problems of the future so that we may determine whether these wilderness qualities of the Forest Preserve should be maintained, while we prepare, as we should prepare, for increasing thousands of our citizens to enjoy this environment.

What is the Forest Preserve? It is one of our great natural resources; it is an historical and a cultural resource; it is expanse; its purpose is wilderness. It is not a "forest cemetery." On the contrary, it is one of the most beautiful wilderness areas in the United States. It has not been "neglected for sixty-three years." On the contrary, the foresters and the rangers and other employees of the Conservation Department have given their blood and sweat and toil for at least fifty of these sixty-three years, to protect this wonderland against disease and forest pests and forest fires and unlawful cutting. I have been in and over the Forest Preserve, I think, more times than most men. I cannot accept that kind of criticism of one of the finest wilderness areas in the Nation and of the finest men this Department ever had, who have guarded it, and protected it, down to this day.

What is the Forest Preserve? It is a whole complex of nature—trees and rocks and ferns and flowers and wildlife; it is clear water and clean air; it is the beauty of nature, as nature evolves; it is the solitude and the music of stillness; it invites man to adventure, to refreshment and to wonder. It is not mowed, trimmed clean and manicured, like a golf course or a city park. It was never intended to be, because wilderness exists only where nature is free, and where the hand of man is restrained.

These wilderness areas in the Adirondacks and Catskills which belong to all the people are set apart and dedicated by law to be forever wild. Distance, ruggedness, climate and the Constitution are their most effective guardians. Man, of course, is a part of the scene, because wilderness has no human value without man. But wilderness does not mean roads and motels and taverns and dance halls and merry-go-rounds and sawmills. These are all right in their places but wilderness reaches out from the roadside—to be experienced by those who penetrate it, or by those who just look at it. This wilderness, this scenery, these natural

objects, should remain unimpaired for the use of future generations.

What is the Forest Preserve? It is the will of the people of this State, as expressed in their Constitution; in the determinations of governors, in the opinions of attorneys-general, in the acts of legislatures and in the decisions of courts that we maintain this wilderness character for the benefit and the enjoyment of all the people. There are qualities in the Forest Preserve you won't find anywhere else in the Western Hemisphere. These qualities provide that *something* which makes the Forest Preserve one of the great natural wonders of America.

What are the features of wilderness? A landscape of natural beauty; an area removed from the sight and the sounds and the odors of mechanization and industry; a vast area where thousands of citizens can feel safe and removed from highways and gas stations, and billboards and from those other activities, the primary interest of which is making money; a place where full enjoyment of life depends upon one's ability, one's physical skill, one's courage and one's self-reliance. The ideas we hold today about wilderness are the result of many, many years of growth. The seed was planted long ago by great men. They saw a goal. They pointed out the direction. I remember reading about a group of Montana citizens, who for six full weeks back in 1870, had been exploring with increasing awe, the remarkable country which today is known as Yellowstone National Park. At the end of the trail they sat around a campfire talking about this public land of the future. Those practical-minded citizens were so moved by the sight of these great natural wonders and the impact of primeval wilderness that they put aside, every one of them, all thought of personal gain. They there resolved that this wonderland should be forever preserved in public ownership, set apart as a shrine for the use and enjoyment and the inspiration of all.

Pattern for Protection

Then in 1885, when the West was yet little more than a frontier, farsighted men conceived and set aside another of the nation's great treasures—the New York State Forest Preserve in the Adirondack and Catskill mountains. In so doing they set a pattern for wilderness and forest protection which has never been equalled anywhere, and they recognized the need for maintaining this pattern, and these wilderness regions, for the benefit of generations to come. And so for nearly three-quarters of a century, New York State has pioneered, and I believe it will continue to pioneer in guarding its wilderness forests, the scenic splendors of its wilderness landscapes and the recreational values which they provide.

Our Forest Preserve was established in an atmosphere of high idealism. Yellowstone National Park was established in high idealism. The men who gathered around that wilderness campfire in 1870 started the first major conservation movement in the United States. They were soon followed by the men from New York in 1885. These were the acts of unselfish men which have become the guideposts to the world in conservation.

We have inherited a great masterpiece; with that heritage is this obligation: To preserve, to protect and to prepare this area for our enjoyment and inspiration and for the enjoyment and inspiration of our children and all other children to come.

Hue and Cry

Some people today want to remove this natural wilderness in sections of the Forest Preserve. Beyond all the hue and cry that they want to "make the forests more beautiful" by what they call "selective cutting," or "scientific forestry," I am afraid a lot of people across the State will be saying that the lumbering interests wouldn't be wanting to cut trees in the Forest Preserve unless they could make some money out of the deal. Now just what are my good friends in the lumbering business concerned about? All the forests and all the trees we have in New York State are not just in the Forest Preserve. The truth of the matter is that there are only two and a half million acres in the Forest Preserve—while we have in this State over twelve million acres of commercial forests where the lumber people can cut trees all they like under their selective cutting practices. Why then do they want to pour this green gold of the Forest Preserve into the mouths of the saw mills?

As one of the custodians of the Forest Preserve, and in the face of these demands to cut down a part of it, I want to make it clear tonight that I believe these lands should not be taken for logging or for any other commercial operation. On this broad front, the preservation of wilderness depends pretty much upon you. One of the most encouraging developments over the years has been the strengthening of conservation education. An informed public is the best safeguard of the integrity of the Forest Preserve's natural environment. Natural environment is the essential resource of a wilderness forest.

Wilderness serves all the people, particularly those who penetrate it gain its fullest reward. But even the wilderness beyond the road furnishes a tremendous setting and a tremendous background for others. People view and enjoy and are inspired by the wilderness—five, ten, twenty miles away. Destroy that background; lumber off even a part of it and the wilderness disappears. And there will also disappear the pleasure of those whose only contact with the wilderness is experienced as they look outward and over it from a window or from the road.

The future will present many difficult problems, but the same factors which governed the writing of a great Constitutional Amendment will still guide the public in the days to come. I find every indication, as I travel about the State, that the public attitude in favor of preserving our great wilderness forests is becoming stronger.

Public Use

What benefit does the public now get out of the Forest Preserve? Some people would have you think they get none, because we do not allow commercial recreational development or commercial cutting of the timber. Is the Forest Preserve "locked up?" Can we build campsites, open up hiking and access trails, build more wilderness canoe routes, more lean-to's; can we improve our trout streams, our lakes and our ponds? Of course we can. These are some of the things we are doing and should continue to do in the Forest Preserve because wilderness invites people to this kind of adventure, refreshment and recreation. And as I said before, man is part of the scene because wilderness has little human value, unless you can see it, appreciate it and enjoy it. Does wilderness preservation mean discarding hospitality? It does not. Does it mean keeping people out? It does not. Does it mean the elimination of tents and campsites and campfires and picnic areas and hiking trails and lean-to's and canoe routes and public hunting and fishing. Of course it does not. Does it mean people will have to walk a bit to reach their favorite trout stream, or trout pond, or hunting ground? Yes, it means that! There should be no vast network of new highways and jeep roads in these wilderness forests. Without these, there are already open to the people many avenues of enjoyment and relaxation in the Forest Preserve — hunting, fishing, boating, swimming, hiking, camping, picnicking, photography, skiing, and just that plain relaxation which comes from standing out in the open with the wind in your face. We now have all these things, we can continue to have all these things and to increase their opportunities and we can preserve the wilderness at the same time.

(*Continued on page* 36)

The Sport Fisheries of Great S

by Irwin M. Alperin,

Fishing pier at Captree State Park, Great South Bay

FOR more than two years now biologists of the Fish Research Unit at the Conservation Department's Marine District Office, Freeport, Long Island, have pried into the affairs of the fish and the fishermen of Great South Bay. It wasn't just mere chance that the fisheries of this extensive shallow bay were selected for study; there was a crying need to learn something about the fluctuations and changes in the sport fishery catch and particularly that of the fluke (also known as Summer flounder or even fillet of sole at your favorite restaurant).

In previous articles in THE CONSERVATIONIST (February-March, 1956 and December-January, 1956-57) some of the broad aspects of our marine recreational fisheries were described and preliminary information on our South Bay fluke resource was presented. More recently (THE CONSERVATIONIST, June-July, 1958) Marine Biologist John C. Poole reported on the results of investigations into the biology; i.e. growth, migration, food preference, of fluke in Great South Bay.

Along with the biological studies, statistical data of the sport fisheries, with particular attention to fluke, have been collected and analyzed to keep abreast of the present utilization of our finfish resources in the study area. A vast amount of information is already on hand and we are well along in another season bursting with sport fishing activity. Perhaps summarizing part of this information will help you visualize the enormity of our salt-water fisheries, some of their potentials and even induce you to take a crack at tying into a few of these worthy battlers. There's many a thrill awaiting the light tackle enthusiast when he fishes our marine waters!

Returning to our study area on Great South Bay let us first explain where, how and what we collect in the way of information that will help us understand the relationships of fish and fishermen. The area most intensively studied extends from Amityville Channel east to the entrance to Bellport Bay—a distance of approximately 20 miles as the crow flies—and embraces all of the regularly fished spots, including the extremely popular Fire Island Inlet grounds and the adjacent open ocean. Although the Bay is approximately six miles wide at places, much of the area is shallow flats—relatively unattractive to most anglers—so that fishing is concentrated in deeper water sections notably channels, cuts, "drains," the aforementioned Inlet and over rock piles or other marine invertebrate-encrusted structures. As is exceedingly well known to the angling fraternity it is easy to get "skunked" if you don't fish in the right places and this holds true for Great South Bay as well as any body of water. U. S. Coast and Geodetic Chart No. 578 is invaluable in this respect for both the neophyte and experienced angler.

To collect catch statistics from this vast area would be near impossible if it weren't for two facts. First, there are a limited number of ports along the shore of the study area. This facilitates our field interviews with fishermen and captains as the boats return to dock. Second, we have an experienced team of pilot-observers to count boats and anglers over the entire spread, length and breadth, of the survey waters. There is no need here to go into details, but we have established a sampling technique that includes all manner of sport fishermen at all the various locales. Thus we can secure a true picture of what is happening fishingwise throughout the entire region during the periods of investigation. We aim to know how many people are fishing, what their preference is in terms of facilities and how many and what kind of fish they catch. In this manner, we can determine how the catch varies as the season progresses, how the various fisheries maintain themselves from year to year, what size fish are available, where most of the activity takes place and what dangers there are of over exploitation.

How do you prefer to fish? Great South Bay anglers run the gamut. Some choose to board large open or party boats and sail to the fishing grounds with an experienced guide—the boat captain. Other fishermen belong to clubs or can get a group together to charter a boat for the day. A great many anglers like to hire a small boat—a 14- or 16-foot skiff—and they either bring or rent a suitable outboard motor for propulsion. Rowers are almost an extinct species these days. The skiff anglers are free to investigate a number of areas of their own choice rather than being guided by a "skipper." This may or may not pay off. Of course, thousands of people run their own boats on Great South Bay and they comprise a great boating "community." These craft, of every conceivable make, style and size, are frequently used for fishing; in fact, many "South Bayers" keep their boats only as a means of transportation to and from their favorite fishing grounds. Among this group, just cruising around is "verboten" unless fishing tackle and bait are aboard and the day's prospects auspicious!

Another group of salt-water anglers prefers to fish from the land (shore) or an extension of it. In this category Great South Bay has its share of pier and bank

The fishing fleet off Fire Island

South Bay

Aquatic Biologist (Marine)

fishermen and along the outerstrip beaches there are any number of surf-casters tossing lures or bait into the breakers of the wide open Atlantic Ocean. Surf fishermen can reach the oceanfront via causeways spanning the Bay (two to Jones Beach State Park and the newest one to Captree State Park). Or they can take ferries across to Fire Island from several locations (Captree State Park, Bay Shore, Sayville, Patchogue).

For the boat anglers, facilities are more than ample and widely distributed. In *Table 1.* may be found a summary of the available for hire boat facilities inventoried during 1957. The total potential carrying capacity of the for hire fleet, including rowboats and skiffs, is about 5,000 anglers daily during the height of the season. The amount of fishing activity generated by these boat anglers is worth noting. *Table 2.* shows that more than 52,000 sailings took place on Great South Bay from June through September, 1957. This is a good indication of the sustained, intense fishery of the area and it may be highly significant that more than 61 per cent of the trips were made in privately-owned boats.

We have already mentioned how Great South Bay anglers run the gamut of types. *Table 3.* is a summary of angler preference of fishing facility or style. It may be readily noted that boat fishing is away ahead in popularity when compared with shore fishing. Nevertheless, the area has shown considerable growth in bank and pier fishermen from 30,448 during 1956 to 41,421 in 1957. The reason —in all probability—more and better facilities with a big boost from the fishing piers at Captree State Park. Probably if you don't want to rub elbows or boats, surf fishing is your last resort for relative isolation. But maybe the more popular types of fishing deserve their popularity! We'll return to this further on.

From late Spring to early Fall our studies have shown that one species, the fluke, holds the spotlight. During this period last year an estimated 276,500 anglers tried their luck on Great South Bay and of these 213,348 were fishing, at least part time, for fluke. This fish really has a near monopoly on fisherman interest during the Summer period with almost 80 per cent of all anglers trying for them. Fluke fishermen accounted for approximately 791,000 of these tasty flatfish with an estimated total yield of 805,000 pounds. These figures are on the conservative side since they do not include fish taken during May, even though some anglers start their "fluking" that early. If this *doesn't* sound like a lot of fish let it be pointed out that our commercial fisheries working in the Atlantic Ocean off Great South Bay for a seven-month period accounted for only 532,000 pounds of fluke. Marine sportsmen catch a lot of fish! It just takes a few tallies like ours to throw light on the actual numbers.

Some pertinent information about the fluke resource may not be amiss here. First off, as previously mentioned, most Great South Bay anglers fish from boats and at the same time more fluke per angler are caught from boats. Although bank, pier and surf fishermen constituted more than 11 per cent of the total fluke anglers last year their catch amounted to less than 1 per cent of the total yield. Over the season as a whole, rowboats took about 17 per cent, open and charter boats 53 per cent and private craft about 30 per cent of the total catch. Although only 31 per cent of the anglers preferred to fish from the large boats, they did relatively well in landing fluke. These boats are operated by professional boatmen, many of them on the water daily throughout the season and therefore bet-

light, looking west toward inlet

Table 1.
Boat Facilities—Great South Bay
April-October, 1957

Type of Boat	*No. of Locations*	*No. of Stations*	*No. of Boats*	*Average Boats Per Station*
Rowboats & Skiffs	12	24	492	20.5
Charter Boats	5	10	70	—
Open Boats	4	6	36	—

Not including privately-owned pleasure craft.

Table 2.
Boat Activity—Great South Bay
June-September, 1957

Sailings

Facility	*June*	*July*	*August*	*September*	*Total*
Rowboats	4,000	4,826	3,648	1,140	13,614
Open Boats	814	897	540	315	2,566
Charter Boats	1,236	1,097	1,044	560	3,937
Private Boats	8,236	7,938	10,536	5,765	32,475
Total	14,286	14,758	15,768	7,780	52,592

Table 3.
Fishing Style—Great South Bay
June-September, 1957

Month	*Rowboats*	*Open Boats*	*Charter Boats*	*Private Boats*	*Bank*	*Pier*	*Surf*
June	10,040	11,803	18,046	25,120	2,516	4,234	576
July	13,223	13,814	15,248	29,212	3,797	8,360	575
Aug.	10,871	6,588	11,380	36,349	3,059	13,180	1,257
Sept.	2,896	2,961	5,768	18,102	740	5,535	1,250
Total	37,030	35,166	50,442	108,783	10,112	31,309	3,658
Percentage	13.4	12.7	18.2	39.3	3.7	11.3	1.3

ter able to locate the "flatties" and keep up with their peregrinations within the Bay. Nevertheless, the small boat anglers caught about 47 per cent of the fish without guidance other than their own experience.

Another important point and one that requires some discussion can be prefaced by the fact that more than 50 per cent of the fluke catch for the 1957 season was made during June and over 81 per cent during the first half of the Summer. Now, any of our readers who are "old time" fluke fishermen are aware that in years gone by the best fishing was during the hot Summer months; sometimes it really didn't get under way until August. Although not too many detailed reports are available it has been established that formerly the peak of the fishery took place in late July and early August. The best fishing has been shifted a month to a month and a half earlier these last years (at least since 1955) and although we still are working on the answer to this perplexing question we do know from our collected data that June (especially) and July are currently the big fluke months. To would-be fluke fishermen we need say no more. Don't wait until too late in the Summer.

How has this pattern compared for the two completed years of our survey? Well, some surprising things have shown up, particularly the magnitude of the fluctuation in catch which is a reflection of the availability of fluke to the recreational fishery. During the 1956 season the total catch was estimated at 1,782,000 fluke as compared with the 1957 landings of 791,000 fish. This amounts to a decrease of almost 56 per cent. A big drop! Actually from 1956 to 1957 there was an increase in the number of fluke anglers so the net result could only be smaller bags per angler this past year. For example let us examine the rowboat catch. In June, 1956 the fluke catch per angler was 9.0; in June, 1957 it was 8.5; July, 1956, 9.4, July, 1957, 3.0; August, 1956, 4.0, August, 1957, 1.5; September, 1956, 1.7, September, 1957, 0.9. So we see there was a comparable trend; the fishery declines from an early season high to a late season low with a precipitous drop near mid-Summer. These characteristics are exhibited both years but the catch rate (unit of effort) for 1957 is poor when compared with that of 1956 and reveals how the annual total could be reduced by 56 per cent.

Total catch by gear and month for the 1957 season is shown in *Table 4.* Despite the fact that the catch fell off from the banner year 1956, there are some impressive totals and on the basis of the 213,348 fishermen who tried for fluke they amount to about 3 and ¾ fish per angler. At least 98 per cent of these 790,798 flatfish were taken on natural bait. Although fluke can actually be caught on a wide variety of baits, Great South Bay fishermen prefer to use either live "killies" (the common killifish, *Fundulus*) or dead "shiners" (the spearing, *Menidia*). Frequently, as an added attraction, a long narrow strip of fresh squid is included in the offering. The fact is that squid alone will take fluke and so will seaworms, clams, shrimp and other marine invertebrates. The fluke is an active, predacious fish—open his mouth and glance at those large, sharp teeth—and likes to take a moving bait. That's why boat fishing is so popular; the anglers can drift around and keep the bait moving in the tidal currents. But innovations are beginning to appear in the fluke fishery. There are now some anglers who wade the flats with spinning gear or even fly rod and take fluke by casting and retrieving. Artificial lures can and are being used by a few "independent" thinkers. These anglers have shown that under certain conditions fluke haven't the time to smell or study a moving object—just whisk something by that may imitate a tasty snack and the fish is liable to snap at it. In this category, feather lures and bucktails fished near the bottom are best but we've recorded a catch made on a small wobbling spoon. Light tackle angling for fluke is gaining in favor every year but it cannot be practiced, for obvious reasons, on big boats where there may be as many as 50 or more lines over the side at the same time. Here, conventional salt-water bay fishing tackle, heavy boat rods, surf casting rods and small "derricks" are still most popular. Even hand lines are used from boat or pier and they can and do take fluke. It takes but a short while to master the rudiments of fluke fishing but practice and the observation of the fish's habits makes a difference in the number of fillets in the freezer. Tides, winds, food supply, water temperature—all have an effect on the whereabouts of *Paralichthys dentatus,* our most important fishery resource in Great South Bay.

Yes, fluke are very important to the recreational fisheries of Great South Bay but in our enthusiasm we must not overlook the fact that they are available for only a part of the fishing season (albeit a delightful time of the year and the height of our vacation days). A number of other species are available during this same period and still others are commonly caught before and after the fluke season. In close competition for the angler's time is the very popular, often abundant Winter flounder. This is another flatfish but of a different disposition than the fluke. The Winter flounder or "blackback" prefers the cooler months to visit our bays and bites well in Spring and Fall moving offshore to seek lower temperatures during the heat of Summer. The flounder fishery is important enough to warrant a separate article but that isn't possible here and now. However, it is of interest to know that even during the height of the fluke season (June, 1957) among 10,558 fish taken by 1,150 interviewed anglers, 2,890 or more than 27 per cent were flounders. Of course, this fell during the Summer, to 15 per cent of the catch in July and August and 10 per cent in September. However, by October the flounder catch was up to 31 per cent of the total and reached 87 per cent in November.

Other species taken in some numbers include blackfish, bluefish, blowfish, eels, kingfish, sea bass, snappers, striped bass, weakfish and last, but not least, blueclaw crabs. These last, of course, are not fish but wideawake, pugnacious crustaceans. Our studies of most of these species are not as comprehensive as those we have made on fluke but data on their abundance and availability are accumulating rapidly. Sport fishermen take them all in season in Great South Bay. Why don't you join them and add a few statistics of your own?

Table 4.
Fluke Catch—Great South Bay
June-September, 1957

Caught from	*June*	*July*	*August*	*Sept.*	*Total*	*Percentage*
Rowboats	77,231	37,566	15,231	2,147	132,175	16.7
Open Boats	82,008	66,404	28,503	4,367	181,282	22.9
Charter Boats	135,300	54,893	35,278	9,806	235,277	29.8
Private Boats	101,364	87,356	37,949	10,414	237,083	30.0
Bank, Pier, Surf	2,097	1,780	716	388	4,981	0.6
Total	398,000	247,999	117,677	27,122	790,798	
Percentage	50.3	31.2	14.9	3.4		

This article is based on studies conducted by the Conservation Department under the D.-J. (Federal Aid in Fish and Wildlife Restoration) program.

The Summit House on top Whiteface Mt. — weather instruments on the roof and within sheltered interior

Museum in the Sky

A Weather Laboratory Is In The Making On The Roof Of New York

by Nick Drahos

PERCHED high in the sky, nearly a mile above sea level atop Whiteface Mountain in the northern Adirondacks, there's something new under the sun—a "museum of the atmosphere." Actually, it's a weather station but with the distinction of being the highest one in New York.

Like all weather stations, the people who make it "click" are meteorologists who, in this case, are associated with the State's Whiteface Mountain Authority. These men will feed regular reports on the anatomy of the weather into the normal channels, but more than that, these scientists will be conducting basic weather research.

They couldn't be better situated! Weather and mountains seem to have an affinity, anyway, and in the case of Whiteface there can be no doubt of the relationship. Weather on that mountain is almost never just "so-so." When it's cold up there it's strictly a deep freeze; when the wind blows, it can rip the hair off your head; when it's clear, the sunshine seems focused through a prism; when it's cloudy (and the top of the mountain is frequently in the clouds) or foggy, visibility is as zero as in the London variety. Yes, it's the right place to study weather and that's precisely the reason the station is there.

When completed, you will be able to see working models, diaramas and time-lapse photographic movies of such things as St. Elmo's fire, lightning effects, the formation of clouds, a tornado, the relative sizes and densities of pollen, of ice nuclei and of industrial and natural smokes. You will be able to see and form an understanding of the cause and effect of rainbows, the glory, the sun pillar, the under sun, the sun dog, blue, yellow and red suns, the corona and ice crystal halos. You will see multiple collecting weather instruments that register temperatures simultaneously from a dozen different points on the mountain; others that measure the liquid water content of passing clouds; the reflected light from upper clouds; the amount of heat striking the earth during the day and the amount of heat lost during the night; the dew point and existing visibility; the amount of static electricity in the air. One instrument keeps constant watch for radioactive clouds. You will see all of these plus such standard weather station instruments as rain gauges, barometers, anemometers and wind wands.

View from the summit of Whiteface. Catwalk to the "Castle" in foreground

1 Outside temperature recorder
2 Simpson ohmmeter—checks voltage of circuits
3 Micro-barograph — registers atmosphere pressure gradients
4 Varian recorder—measures reflected light from clouds
5 Seven-day rain recorder — tipping bucket rain gauge attached
6 Keithley electrometer—measures atmospheric electricity
7 Dew cell — measures dewpoint and temperature
8 Aerovane — measures direction of wind in degrees and velocity
9 Brown electrometer recorder—a 12-channel recorder capable of recording 12 different temperatures at the same time
10 Brown electrometer recorder for measuring solar radiation—measures amount of heat striking earth during the day and amount of heat being given off during the night
11 Mercurial barometer — measuring barometrical pressures
12 Visual rain gauge—reads from water-collecting bucket on roof

This museum of the atmosphere on top of Whiteface is still in the "making stage" right now. Part of it is finished and in operation. Present plans call for an enlargement of the Summit House to shelter the weather instruments, charts, diagrams, working models, diaramas and exhibits of alpine plants and animals.

The objectives of this weather station are two-fold. The first is to collect and make weather data available to other agencies; second, to educate the public in the fascinating science of weather.

It is hoped that Whiteface Mountain

(*Continued on page* 36)

Cayuga Lake Trout —

Part 2–Their Distribution and Movements

by Dwight A. Webster,
Professor, Fishery Biology,
Cornell University

CAYUGA LAKE has an area of 66 square miles and a maximum depth of 435 feet. Most of the lake is potential trout habitat for much of the year. This provides a lot of territory for a lake trout to swim in and for a fisherman to fish in. Fortunately, conditions are such that the two can get together with reasonable frequency.

The current study of lake trout in Cayuga has been primarily concerned with the role of hatchery-reared trout in maintaining the population and with other pertinent management statistics. Underlying this study are a fair amount of basic data fundamental to drawing up management recommendations, but also of direct interest to anglers. For example, in the preliminary stages of the investigation there was an immediate need to determine the degree to which lake trout utilized the deeper waters. This had a bearing on the sampling program, but has obvious implications to angling. Similar comment applies to movements and distribution of trout as determined by tagging.

Depth Distribution

Cayuga Lake has an ample supply of oxygen at all depths so that this does not limit the use of the deeper water by trout. In 1950, a former graduate student, James Galligan,* undertook a study of the vertical distribution of lake trout in Cayuga.

The procedure consisted of setting gill nets at right angles to the shore, starting them at a depth that was slightly above the habitable range of lake trout and extending outwards into the lake—following the bottom gradient—for the length of the net (usually 500 feet). The bottom in Cayuga Lake drops off quickly in many areas so that the deep end of the net often fished at substantial depths. The position of captured fish was noted along the length of the net as it was lifted. This information was later correlated with the known profile of the lake bottom in the area fished.

The results of this study are summarized in *Figure 1*, showing the depth at which lake trout were caught. In this chart, the width of the pattern band approximates the relative abundance of trout at various depths during the months of June, July, August and September. It will be noted that lake trout move to greater depths as the Summer advances. This is old stuff to lake trout fishermen. Lake trout and warm water don't mix, and it is evident that with higher surface temperatures, trout are forced deeper and deeper. The uppermost limits in these distribution figures correspond with a temperature of about 60° F. Thirty to 40 feet would be reasonable depths to fish in June and July, but it is obvious that late season anglers should be working water of 70 feet or more.

There is a limit to the depth commonly inhabited by Cayuga trout. It is evident that most of the trout live in water less than 150 feet in depth. Contrary to general opinion, lake trout are not particularly fond of "ice cold" bottom waters, even when abundant oxygen permits travel there. Below depths of 200 feet Cayuga Lake temperatures are reasonably constant at about 39° F. in the Summer. This is not a good temperature for growth and there is little suitable food at such depths for large trout. The average preferred temperature of lake trout is about 50 degrees according to laboratory tests by scientists at the University of Toronto. The study was conducted by placing lake trout in a large vertical tank, the water in which exhibited a temperature gradient from top to bottom. Positions taken up by the fish were noted through windows in the side of the tank and related to temperatures at that depth.

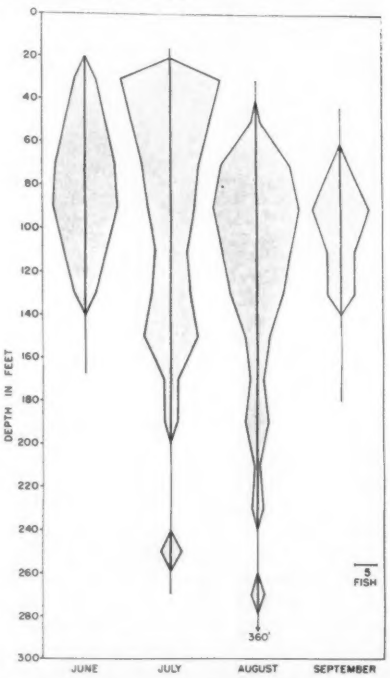


Figure. 1. Depth distribution of lakers during Summer

One must realize that the temperature gradient in a deep lake is not gradual. The temperature cycle in water is too detailed to explain fully in this article, but the essential features for the Summer period are as follows:

A lake has a warm surface layer of water that increases in thickness as the Summer progresses; by late Summer in Cayuga Lake, this layer lies at a depth of 50 to 70 feet. This water follows the air temperatures, rising or falling slightly in warm or cool weather. These temperature changes are dependent upon wind action to a considerable extent. The wind also determines the depth to which the warm water layer penetrates. Below the warm layer is a fairly narrow band where the temperature drops very quickly; then it gradually falls to the minimum bottom temperature in a third layer. Bottom temperatures vary among lakes, depending largely on depth, and exposure to wind. In the deeper lakes, of which the Finger Lakes are prime examples, the minimum temperature is about 39° F. Actual Cayuga Lake Summer temperature in the three layers might be:

Depth	Temperature Drop
Surface to 60′	68-66°
60-80′	66-48°
80-400′	48-39°

Stability of the temperature layers is never complete as it is affected by weather and currents. In the smaller Finger Lakes, the thickness of the warm surface layer is not so great, as wind has correspondingly less effect.

One limitation of the data in *Figure 1* is that it reveals only what happens when the trout are following the bottom where the gill nets are fished. Lake trout are generally considered to be primarily bottom inhabitants. However, angling suggests that at times they move into

*Jim Galligan is well known to many sportsmen in Central New York inasmuch as he served for several years as a biologist in the Central Fisheries District, Norwich. He is now Supervisor of Fisheries Management for the Board of Fisheries and Game of the State of Connecticut.

the open waters, presumably to feed on pelagic (open water) schools of sawbellies. The "Seth Green rigs," a common unit of angling gear in the Finger Lakes area, were developed specifically to ferret out the position of the lake trout by the several spoons strung out over the length of a drop line. In recent years a large flasher type of lure that originated on the West Coast has been successfully used by a number of anglers fishing mid-lake and off bottom. As a general rule, however, the bottom is the most productive area to fish for lake trout. Accordingly, it pays to be familiar with the bottom contours if one is seriously interested in Summer lake trout fishing. The "old timers" know the submarine valleys and ridges of Cayuga Lake and take in or pay out line accordingly.

Seasonal Movement

When surface waters are cold during the Winter and Spring, the lake trout may be inshore, often in water only a couple feet deep. The Winter movement into shallow water is very conspicuous but reasons for this are not clear. There seems to be no food of consequence available and the possible influence of water temperature is not convincing, although little studied. Through late Winter and early Spring the lake is homothermous; that is, the same temperature from top to bottom. Since Cayuga Lake does not normally freeze, cooling continues throughout the Winter and temperatures usually run from 34° to 36° F.

The habit of frequenting shoal water in the Spring makes for more interesting fishing. The advent of spinning has completely revolutionized lake trout fishing in Cayuga Lake as successful angling can be experienced from shore as well as from boat. Lake trout seem easy to catch provided they can be located. The good Spring fishing stems from greater availability . . . trout are concentrated in a relatively narrow shore zone and can see the lures or bait readily. Fishing takes a nosedive if the water becomes roily due to heavy run-off in the tributary streams. Even when trout are inshore it is still a good rule to fish close to bottom, even if it means snagging (and often losing) a few lures now and then. There is enough irregularity to these Spring movements to preserve most of the uncertainty distinctive of angling. Trout may move in—and stay in—over a relatively long period of time or may be more erratic in behavior. It is not uncommon to fish for several hours and have all the activity in a comparatively short space of time.

Fall distribution of the larger trout is conditioned by spawning habits. Trout in some of the Finger Lakes (as well as the Great Lakes and perhaps elsewhere) are characterized by deep spawning populations of trout. This is in contrast with Adirondack lake trout, for example, that travel into shoal water to spawn on gravel bars. Lake trout of Cayuga and Seneca, the sister lake to the west, spawn at depths of 100 feet or more. They seek out areas where the bottom is kept clean by strong sub-surface currents. A former graduate student, Dr. W. F. Royce, took underwater photographs of the trout spawning area off Peach Orchard Point in Seneca Lake. The bottom gravel had a well-scrubbed look as though it had just been brushed. In Cayuga Lake the traditional spawning place for lake trout is at Taughannock. Adult trout concentrate here in late September and October. Other areas attract some spawning fish —Frontenac, Crowbar, King Ferry—but not in such numbers.

Tagging

The concentrated spawning population at Taughannock is a convenient area for obtaining numbers of lake trout for tagging. Subsequent recapture of these marked fish has furnished information on the movements and general distribution of lake trout in Cayuga Lake.

Figure 2 shows the recapture area of tagged lake trout in Cayuga Lake, recoveries made a year or more after release. As only angling recaptures are involved, the number of returns are a fair indication of fishing success in various parts of the lake. There is a widespread scattering of returns throughout the lake, but certain areas are notable for recoveries. A fruitful interpretation, however, requires additional data on the season of the year in which the recoveries were made.

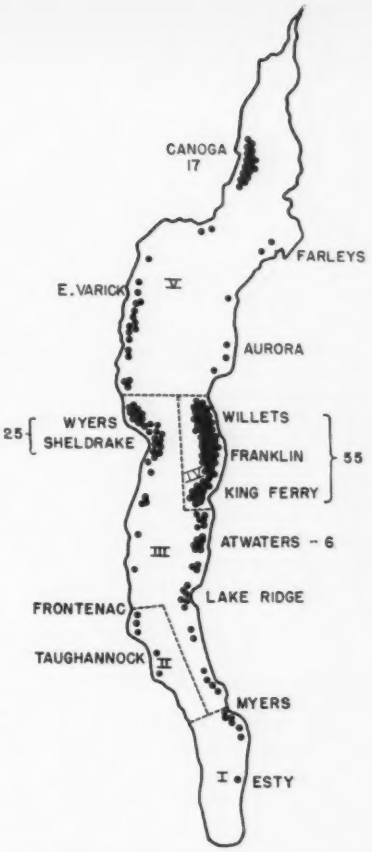


Figure 2. Cayuga Lake areas of recapture. Dots represent tagged fish

To explore this, the data are restricted to trout tagged at Taughannock in the Autumn and recovered during the season

(*Continued on page 26*)

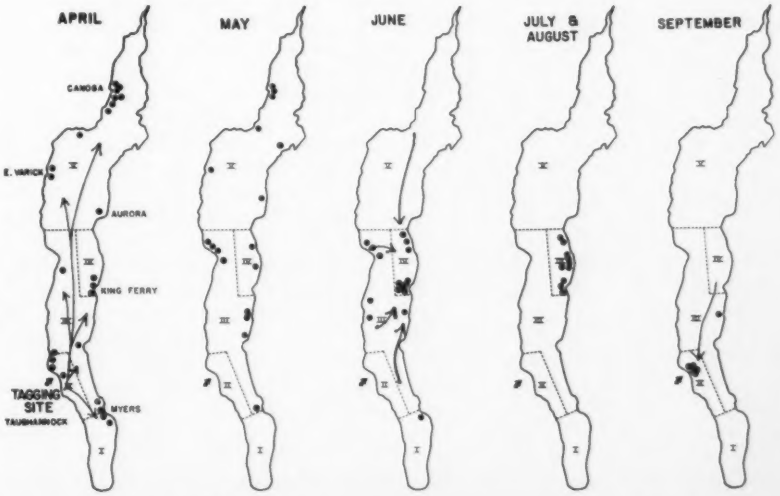


Figure 3. Dots represent tagged lakers; arrows probable direction of travel after tagging at Taughannock previous Autumn

Wildlife and

by Joe Kubota[1],
and Gustav A. Swanson[2]

Wildlife abundance is as closely associated with soil fertility as bread is to butter.—Editor

TO the thoughtful sportsman it may seem quite obvious that wildlife depends upon soils. This, however, is one step further than usually taken. It's customary, in discussing fish and game abundance, to talk mostly about food and cover—its quantity and quality. Yet plants, which directly or indirectly provide wildlife with food and cover, certainly depend upon soil. Even aquatic plants, and indirectly also fish, get many of their essential nutrients from the soil of the surrounding watershed.

The soils-wildlife relationships, however, are more complex than most sportsmen realize, and some of them have been discovered only recently. The relationships of wildlife to soils and to nutrition generally, are, in fact, a very promising field for future research. Little research of this type has been done in New York State, so some of our best illustrations of established soils-wildlife relationships as described in this article are taken from elsewhere in the country.

Most people recognize differences in soils. It is not difficult for people to see differences between the soil in a poorly drained depression and a well drained soil; they can see textural differences between a heavy clay soil and a sandy soil; or they can see color differences between a red soil and a yellow soil. These are observable differences. But many soil properties cannot be seen. These are chemical and physical properties that must be studied in the laboratory. Some of the chemical soil constituents would be the common nutrients like nitrogen, phosphorus, calcium, magnesium, sodium and potassium. Their total amounts can be readily determined but that portion available and taken up by plants is more difficult to measure. Macronutrients (those present in considerable quantity) are more readily studied than the micronutrients and consequently more is known about them. The micronutrients are chemical elements in soils that are present in very small amounts. Some like boron, copper and zinc are essential for the growth of both plants and animals, but others like cobalt are essential only for the animal, at least as far as can be determined today. Although required in only small amounts, the micronutrients significantly affect the well being of plants and animals.

The integrated effects of soil properties influence the growth of plants, the kinds of plants present, and the nutritive quality of plants. Both macro- and micronutrient contents vary in the same species of plant with the soils in which the plant is grown, and of course differences in plant species and changes in plant population due to soils necessarily influence the nutritional status of a given area.

In New York, many kinds of soils are recognized on the basis of differences and similarities in their properties. The many different soils are grouped together (see *Figure 1*) into broad groups having soils with common properties.

The distribution of the broad soil groups in New York roughly approximates that for glacial deposits on most of the lowlands and much of the highlands. Differences between soils, then, are related primarily to rocks in the glacial deposits and to soil drainage. The soils from such glacial deposits are relatively young and have not been intensely weathered when compared with many other soils in the world. The soils of the Adirondacks and Catskills, however, are derived mainly from underlying bedrock, except in some of the mountain valleys where glacial deposits occur. Glacial activity must have been extensive here, but evidences of such action have largely been obliterated with time.

The soils best suited in New York for generalized agriculture occur in a broad soil strip from the Lake Plains area east through the Mohawk Valley (see *Figure 2*). This is also the broad belt of high lime glacial deposits. Smaller areas also occur in other parts of the State where soils have a similar origin and properties. These soils on calcareous glacial till and lacustrine deposits are recognized as Gray-Brown Podzolics. They are inherently fertile and are utilized for growing a wide variety of crops, including alfalfa, wheat, corn and oats. The major and micronutrients in the soils are generally adequate for plant growth and in most cases, the plants are able to take up sufficient amounts of these elements for the needs of the animals. The area is free of reported troubles in animals that might be related to deficiencies in soil nutrients.

Now for some specific soils-wildlife relationships. Areas which are poorly drained because an impervious soil layer lies close to the surface, are usually not cultivated; at least not intensively. This in itself often results in the presence of much natural growth used by wildlife. But, in addition, these areas make excellent sites for the building of ponds and marshes which attract a large variety of wildlife. The mallards, wood ducks, green herons, spotted sandpipers and the deer and raccoon which frequent the more than a thousand artificial small marshes in New York are there, in a very real sense, because of the type of surrounding and underlying soil.

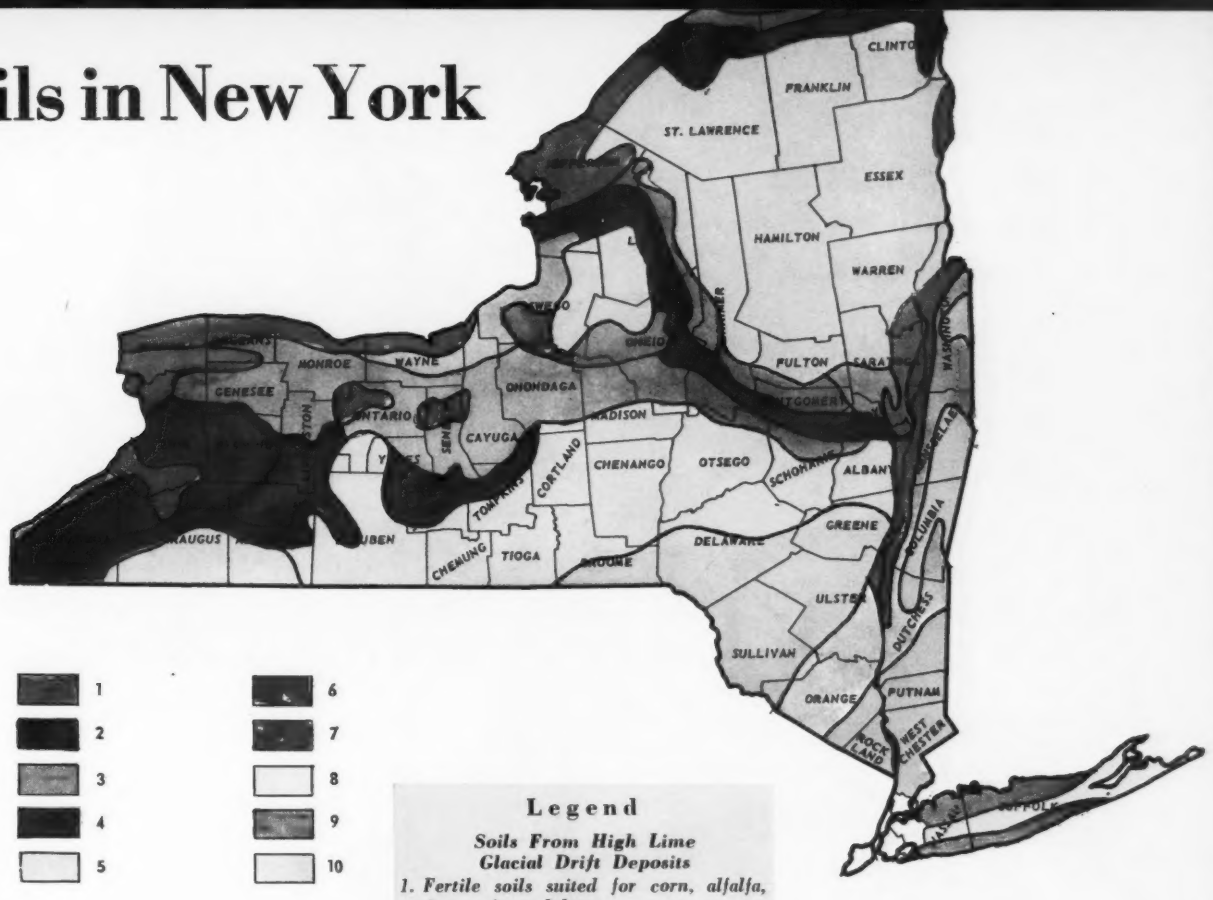
The pheasant is particularly tied to certain soils characteristics. As *Figure 3* and *Figure 4* show, the areas of greatest pheasant abundance in New York are also areas of small grains and corn production. This is no coincidence. Pheasants thrive on a diet of corn and small grains and do best where these are grown. Such foods, however, are too low in calcium content to supply the pheasants' needs of this element for reproduction. Although they also eat high-calcium foods like alfalfa or clover when available, the birds customarily make up the calcium deficiency directly from the grit which they eat, which must, therefore, have a high lime content. Any poultry farmer would expect this. He realizes the necessity to feed his laying flock oyster shell by the hundred weight. The need of a high lime grit by pheasants has been, however, only recently established.

A particularly striking example of the pheasant dependence upon high lime soils was described by Dr. Fred Dale from Pennsylvania. He describes a limestone valley near Lancaster as . . . "well known as a good pheasant area," while nearby is . . . "the non-calcareous" (low lime) Piedmont, almost as fertile, with a similar agricultural pattern, yet practically devoid of pheasants." Dr. Dale actually counted 1,214 pheasants in 18 field counts in the limestone area, and saw none on 8 field trips under similar conditions in the non-calcareous area—a striking difference indeed! And yet the two areas, only 10 miles apart, are generally similar in appearance, and had almost identical proportions in corn and in wheat and oats—38.3 per cent and 39.3 per cent, respectively.

In Missouri, where many studies of soils-wildlife relationships have been conducted, over 8,000 raccoons were weighed and the average weights for each county compared with the soil fertility rating of the county. The largest raccoons invariably came from the counties with the most fertile soil, and vice versa, and the differences were striking. For males the average weights ranged from 12 pounds in the lowest fertility county to 18.5 pounds in the most fertile. Among females the difference was even greater—from 8.6 to 17.6 pounds! The largest *numbers* of raccoons, however, were taken

[1]Research Soil Scientist, Soil Conservation Service, U.S.D.A., Ithaca.
[2]Head, Department of Conservation, N. Y. State College of Agriculture at Cornell University.

d Soils in New York



Legend

Soils From High Lime Glacial Drift Deposits

1. Fertile soils suited for corn, alfalfa, spring grain and hay.

2. Moderately to highly fertile soils suited for hay, spring grain and other crops adapted to climate of northern New York.

Strongly Acid Soils With Dense Subsoil on Glacial Till

3. Soils of low to moderate fertility suited primarily for hay, corn and spring grain.

4. Soils of low to moderate fertility and with impeded drainage; suited for hay and spring grain and, locally where well drained, for corn, alfalfa and specialized crops.

5. Soils of low to moderate fertility, suited for hay and spring grain and, locally for corn and alfalfa where soils not excessively stony, shallow to bedrock or on excessively steep slopes.

Slightly To Strongly Acid Soils On Glacial-Lake Deposits

6. Moderately fertile soils — forage crops and fruits, vegetables.

7. Soils of moderate to high fertility and with impeded drainage — hay and spring grain and locally, corn and alfalfa where well drained.

Strongly Acid Soils From Sand and Gravel

8. Easily tilled soils of low to moderate fertility well suited for specialized crops.

9. Soils of low fertility and seasonal droughtiness; generally ill-suited for most crops.

Shallow, Stony Soils On Steep Slopes

10. Soils locally suited for hay and spring grain; primarily in forest.

from the counties with moderately high fertility, rather than in the most fertile areas. It was concluded that the more intensive farming practiced in the *most* fertile areas eliminated so much of the raccoon habitat that their potential production of raccoons was not realized.

It is plain that our knowledge of the role of soils in influencing wildlife populations and welfare is inadequate and that much more research is needed. While this would be a very basic type of research in many cases it can lead to management recommendations of great value. The knowledge already gained through the intensive studies of domestic stock have been all too seldom tested on wildlife. The importance of cobalt, a "trace element" or "micronutrient," to cattle and sheep is well known, for example, and it is regularly supplied in the many deficient areas.

In big game, on the other hand, definite information on the role of cobalt is almost completely lacking. The size of deer and deer herds have been related to plants and soils in some areas in the United States. For example, the deer do not thrive in the midst of abundant browse in the Holly Shelter Wildlife Management Area in North Carolina. Cattle also will not thrive on the native browse in the same general area and will become sick without supplements of cobalt salt. Soil-plant studies in this area have shown that the cobalt content in the forage is low, a deficiency directly related to small amounts of cobalt in the soil. A similar relationship may exist in certain areas of New York.

There is also an account from Nova Scotia, in a likely cobalt-deficient area, where a very sick moose, with symptoms of the "moose disease" which has puzzled wildlife pathologists for decades, responded in a miraculous manner to the standard treatment with cobaltous chloride as used on livestock. Cobalt is easily supplied to livestock in their salt. The same could be done with moose and deer, if the need were definitely found to exist.

The influences of soil on wildlife, it is plain, are important and varied. The examples given, even in the fragmentary state of our knowledge, could be multi-

(*Continued on page* 18)

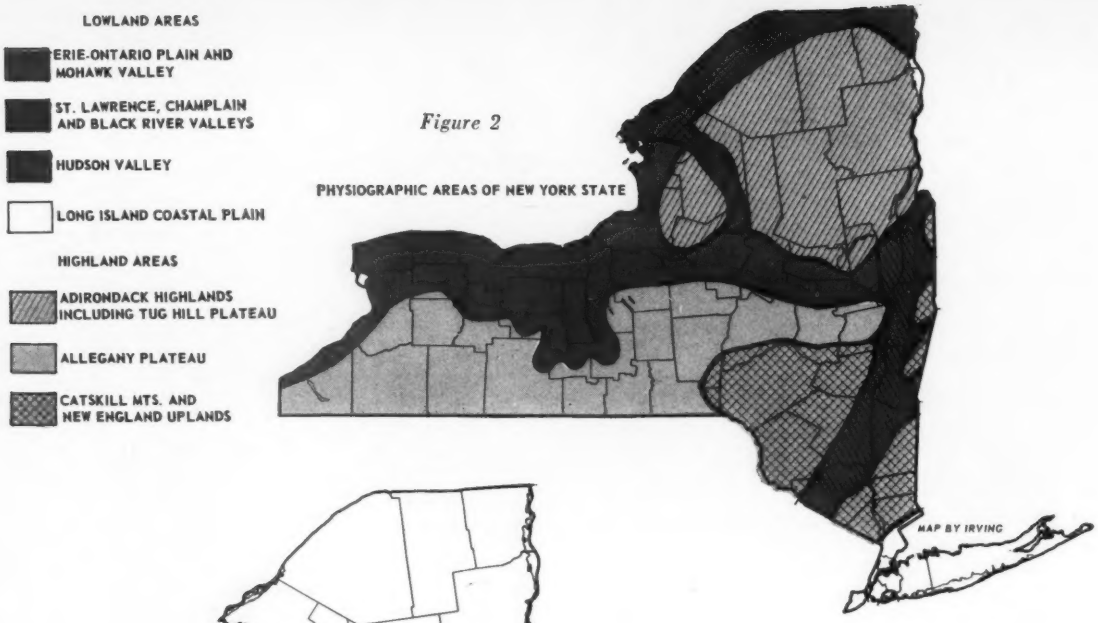

LOWLAND AREAS
ERIE-ONTARIO PLAIN AND MOHAWK VALLEY
ST. LAWRENCE, CHAMPLAIN AND BLACK RIVER VALLEYS
HUDSON VALLEY
LONG ISLAND COASTAL PLAIN
HIGHLAND AREAS
ADIRONDACK HIGHLANDS INCLUDING TUG HILL PLATEAU
ALLEGANY PLATEAU
CATSKILL MTS. AND NEW ENGLAND UPLANDS
PHYSIOGRAPHIC AREAS OF NEW YORK STATE
MAP BY IRVING

Figure 2

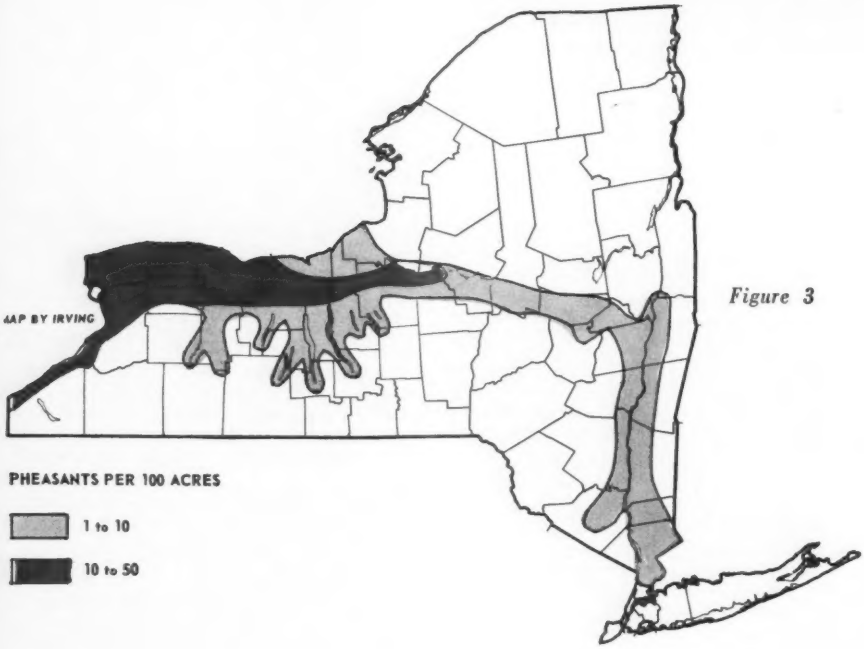


Figure 3

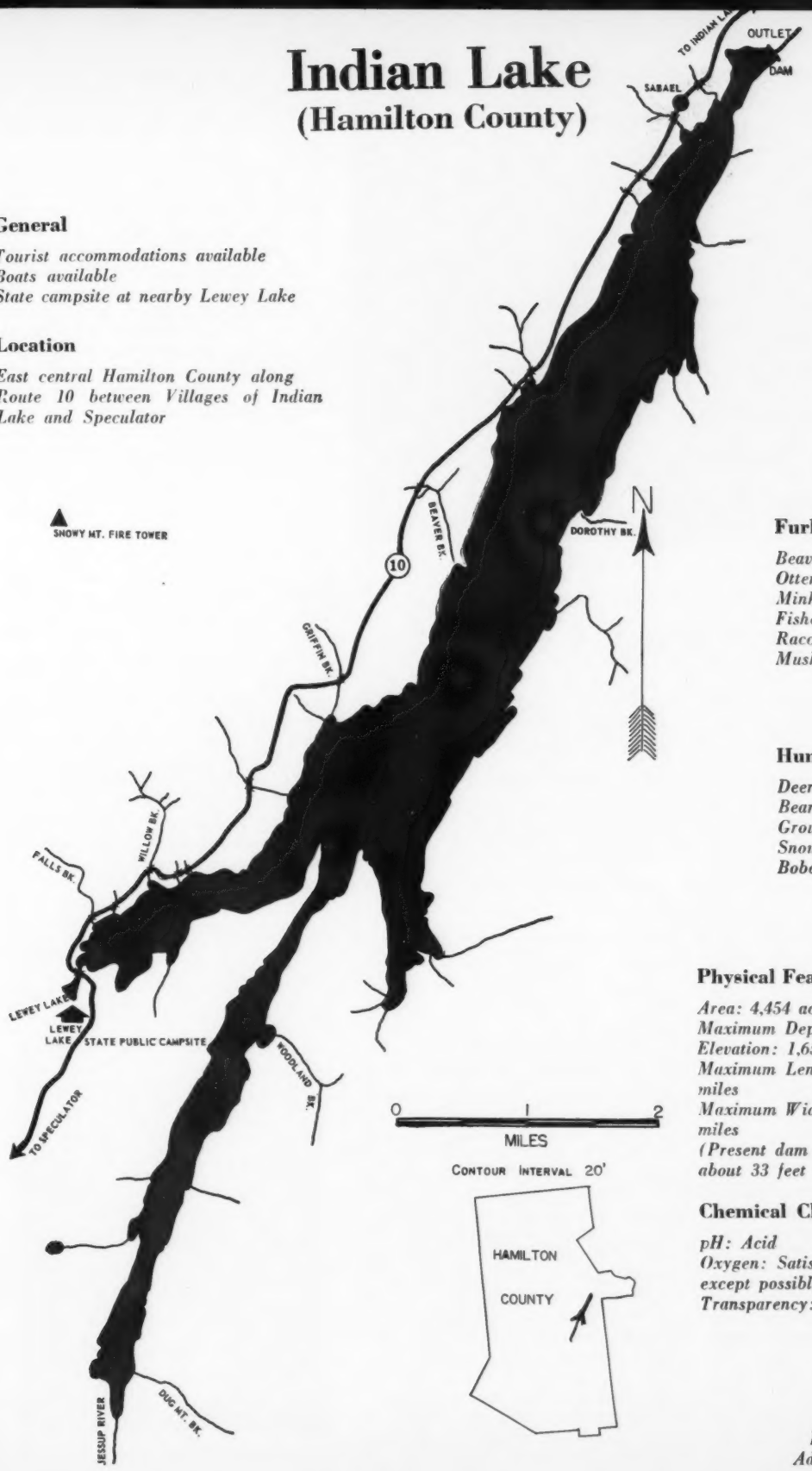
Figure 4

(Continued from page 17)

plied many times. The very impervious soils which cause so many New York farms to be abandoned encourage some wildlife, limit others.

Soil characteristics may determine whether an animal can exist in an area; whether it will be able to reproduce its kind; its rate of growth and final size; whether its food and shelter are superlative or meager; whether a deer grows record antlers or spindly ones. Yes, 'though the soil is only one of many factors affecting wildlife, it is one of the most basic, and has been given too little attention.

Indian Lake
(Hamilton County)



General

Tourist accommodations available
Boats available
State campsite at nearby Lewey Lake

Location

East central Hamilton County along Route 10 between Villages of Indian Lake and Speculator

Fish Present

Lake trout
Smallmouth bass
Common whitefish
Northern pike
Yellow perch
Brown bullhead
Rock bass
Sunfish
Minnows
Suckers

Furbearers in Vicinity

Beaver
Otter
Mink
Fisher
Raccoon
Muskrat

Hunting in Vicinity

Deer
Bear
Grouse
Snowshoe Rabbit
Bobcat

Physical Features

Area: 4,454 acres
Maximum Depth: 80 feet
Elevation: 1,650 feet
Maximum Length: Approximately 14 miles
Maximum Width: Approximately 1½ miles
(Present dam raises original water level about 33 feet when reservoir is full)

Chemical Characteristics

pH: Acid
Oxygen: Satisfactory for fish life except possibly in deepest portions
Transparency: Generally clear

—R. G. Zilliox,
District Fisheries Manager,
Adirondack Fisheries District

Photo 1. Swarming evening flight of chafers is characteristic

The European Chafer

by F. L. Gambrell,
Professor of Entomology,
N. Y. State Agri. Exp. Station, Geneva

If your lawn or pasture looks "mangy" this Summer, or your shrubs sickly, you may have some new and unwelcome guests from Europe—members of the scarab beetle group and close relatives of our "June bug." The accompanying article describes the new pest and makes some suggestions for making him unwelcome.—Editor

IN 1940 grubs were observed causing severe damage to lawns and meadows at Newark, Wayne County. This pest proved to be an European species *Amphimallon Majalis Raz.* (*see Photo* 2). This was the first record of its occurrence in the Western Hemisphere.

This insect has been given the common name of European chafer. It is a scarab beetle and belongs to a group made famous by the ancient Egyptians who considered certain species to be sacred. There are many native members of this family and they are known as May beetles or "June bugs." The immature stages of the European chafer occur in the soil where the larva, a stout white grub with a curved body and measuring about one inch in length when fully grown, feeds on the roots of grasses and other plants (*Photo* 2). Scarab larvae are commonly known as "white grubs," those of the European chafer closely resembling native members of this group.

Distribution

Since its discovery, the insect has spread out in an ever widening circular area through natural flight movements and, to some extent, through artificial means. At present it is known to occur in a continuous area occupying about 900 square miles in western New York located in Wayne, Ontario, Monroe and Seneca counties. Within the past five years isolated infestations have also been detected in Chemung, Erie, Niagara, Onondaga and Oswego counties. Attempts have been made by State and Federal regulatory agencies to eradicate these localized infestations by treating the soil with insecticides to control the grub stage. It is still too early to determine the effectiveness of these programs.

Incipient outbreaks have been recorded also in Connecticut and West Virginia. In an effort to eradicate these infestations, intensive soil treatment programs have also been carried on there.

The occurrence of this pest is being closely charted and followed by both the Division of Plant Industry, New York State Department of Agriculture and Markets, and the Plant Pest Control Division, ARS, U. S. Department of Agriculture. These agencies attempt to keep current on the exact boundaries of older infestations and are constantly on the alert to detect possible new outbreaks.

The presence of this insect is often detected by the spectacular flight of adults from the soil just after sunset and by the "buzzing" noise they make while flying around trees. It is often likened to the "swarming" of bees (*Photo* 1). Irregular patches of dead or dying grass in lawns, pastures or meadows are also tell-tale signs of damage by the grubs (*Photo* 3).

If anyone detects either any unusual grub damage to turf or a "swarming" and "buzzing" of beetles around trees and shrubs between sunset and dark, during June and July, European chafer may be involved. They are requested to collect specimens and forward them for identification. The insects can be killed and preserved by placing them in a screwcap type vial or any small, tightly-capped bottle containing rubbing alcohol. Specimens may be sent to (1) the U. S. Department of Agriculture, P.O. Box 28, Newark, N. Y., (2) Department of Entomology, Cornell University, Ithaca, N. Y., or (3) Department of Entomology, New York State Agricultural Experiment Station, Geneva, N. Y. for examination.

Photo 2. Grub stage of chafer in soil

Injury

The adults do little or no feeding and are non-injurious. Injury consists of damage to the roots of plants by the grub stage. Grubs are known to feed on the roots of a wide variety of weeds, grasses, legumes, annual and perennial plants, coniferous and woody plant materials. Plantain, dandelion, cultivated turf and grasses (including timothy and Winter grains) are some of the favorite host plants. Unlike the Japanese beetle, which belongs to the same insect group, the chafer infests long grass as well as short grass areas and could, therefore, become a problem in conservation and reforestation practices. Frequently extensive damage occurs on cultivated turf, golf courses, park grasses, meadows, pastures and Fall-planted grain when grubs are abundant in the soil.

Dead lawn patch result of chafer damage

Life History

Adult European chafers emerge from the soil during June and July. They come to the surface about sunset and fly to trees, shrubs or other objects that loom high on the horizon. At dusk they stop flying and settle down for the night when they mate. At dawn, the following morning, they desert the trees and re-enter the soil. Females deposit their eggs singly in the soil. Under confined conditions, females were found to lay as many as 50 eggs. The eggs hatch in from 2 to 3 weeks, depending upon soil temperatures, and the young grubs start to feed immediately on the roots of plants or other organic matter. The grubs pass through three size-stages or instars by Fall. Feeding continues until the ground freezes in early Winter at which time the grubs move down below the frost line. As soon as thawing occurs in the Spring, the grubs move upward to within 1 to 2 inches of the surface. There they continue to feed until they reach maturity, during late May or early June, when they pupate. In about two to three weeks these pupae change to adults, thus completing the cycle. Normally, there is only one generation annually, although a small percentage may carry over for a second year in some instances.

Control

A number of practical measures have been developed to control the European chafer and efforts are being made either to improve or extend these methods to meet specific facets of the problem. These take the form of (1) stringent regulatory treatment programs to disinfect sod, top soil, gravel, and of soil used as "plant balls" in the movement of plants from the infested areas (listed under the broad categories of immediate disinfestation and residual-type treatments respectively); (2) residual-type treatments for the control of grubs in lawns, parks, cemeteries, golf courses and parkways; (3) treatments for the control of grubs in Winter grains, pastures and meadows.

Research has established that DDT, chlordane, dieldrin, aldrin, endrin, heptachlor and lindane are highly toxic to the grub stage.

Which insecticide should be used will depend on the speed and degree of control desired (that is, 100 per cent or less), how long protection is needed, cost and possible effect on food crops subsequently planted in treated soil.

Table 1 lists five of the insecticides mentioned above with the recommended rate of application for control in nursery plantings and lawns. Any one of the materials listed can be used, but each has its advantages and disadvantages and special features. The writer would be glad to answer specific inquiries on this subject and others.

Table 1

Approximate amount of Insecticide in Pounds or Pints Per 1,000 Square ft. Suggested for the Control of European Chafer in Lawns and Nursery Plantings

Insecticides	*Rate Per Acre*	*50 Per cent Wettable Powder*	*5 Per cent Dust*	*Commercial Emulsions*
Dieldrin	5	¼ lb.	2½ lbs.	½ pint
Chlordane	20	1 lb.	9 lbs.	½ pint
Aldrin	5	¼ lb.	2½ lbs.	⅓ pint
Heptachlor	5	¼ lb.	2½ lbs.	⅓ pint
DDT	50	2¼ lbs.	23 lbs.	4 ½ pints

NOTE: For recommended dosages on pastures and hay, consult Dr. G. G. Gyrisco, Department of Entomology, Cornell University, Ithaca, New York.

More complete and specific information regarding insecticides, formulations, and methods of application can be obtained by contacting the Department of Entomology at Cornell University, Ithaca, New York; Department of Entomology, New York State Agr. Experiment Station, Geneva, New York; Plant Pest Control Division, U. S. Department of Agriculture, P. O. Box 28, Newark, New York; and Division of Plant Industry, New York State Department of Agriculture and Markets, Albany, New York.

Some Spiders of New York

by D. L. Collins,* *State Entomologist*

If "Little Miss Muffet" had known as much about spiders as you will know after reading this article, she wouldn't have been frightened away.—Editor

TRAPPERS, hunters, fishermen, athletes, builders, weavers—they are all there in H. Wayne Trimm's painting (see center spread). If to a human practitioner of these arts and crafts we ascribe, as we do, the qualities of skill, daring, grace, cunning, beauty, patience, we should do the same for spiders.

In these fascinating creatures, we find many of these qualities to an even more remarkable degree, often embodied in forms of grace and beauty such as can rarely be seen elsewhere in nature. Some of the most interesting spiders are found right in New York State. A few of them are shown here by the artist. Although in the painting they are not represented in their true relative size, each is shown in a typical position or activity.

Spiders as a group are much maligned, but of all the 600 and more species that can be found in our region there is only one that need be feared — the black widow. The fact that although it is common locally on Long Island (but not elsewhere in New York) and yet is so seldom seen is testimony to its retiring habits. The other species, large and small, can be studied and admired without danger, all of them for their interesting habits, and some even for their beauty.

Golden Garden Spider

First we might consider some of the handsome ones. No one who has wandered in an old garden or followed a path through a field of asters and goldenrod in the late Summer sunshine can have failed to see the golden garden spider, *Argiope aurantia*, hanging head down in the center of her orb.

Argiope is worth more than a passing glance. She is seen here (see center spread) in a characteristic pose, with two of her victims—grasshoppers—not far away. In her central position she is actually at the communication center of her little world, and the news of a disturbance anywhere in it is transmitted almost instantly along the adjacent radii to be picked up by the outspread feet of the owner. If she decides that the disturbance is caused by a suitable victim, such as a grasshopper, she will come dashing out to where it is struggling and swath it in thick layers of silk, thus rendering it helpless. She may have several such packages in her web at a time, awaiting her leisure. After she has had her fill of one by sucking out its body juices (she does not chew it up to eat it) she will probably cut it loose and then repair the damage it has done to her net.

Jumping Spider

Next in the picture is the little *Phidippus*, the jumping spider. Actually she is much smaller than the golden garden spider, about a quarter of an inch long. For so small a creature, she gives an astonishing impression of alertness. Alert she must be, for since she makes no snare she must stalk her victims and pounce on them unaware.

Her eyes — eight of them — are arranged in three rows; 4, 2 and 2. The four in front are larger and seem brighter. With this efficient optical arrangement they have the finest eyesight of any spiders. When stalking her prey, *Phidippus* reminds one of a cat—she sees the intended victim at a distance, slowly creeps up on it and then pounces suddenly. Actually, she has several conspicuous advantages over her feline counterpart; eight eyes, eight legs, and —best of all—as she leaps she spins and pays out a silken safety belt. Thus, no matter how badly she may misjudge her distance or position, she can always get back. She can even jump away from a support to catch a flying insect. Perhaps it is this built-in safety feature that gives her the audacity to jump up to forty times her own length—equivalent to a cat jumping forty feet! If you want a friendly little spider for a pet—one that will amuse you with its lively antics —try *Phidippus* or its relative *Salticus*, the zebra spider, which is found nearly everywhere.

The jumping spiders are in some ways the most attractive of all spiders. Many of them are brightly colored or marked with vividly contrasting light and dark stripes. One dark velvety one has bright green iridescent mouthparts, and conspicuous dark shining eyes.

Common House Spider

The spider in the apparently tangled web is *Theridion*, a common house spider, the nemesis of the housewife—the source of "cobwebs." The reason the webs are often so dusty is that some of the strands are sticky. Although the meshes seem irregular there is a basic pattern which makes for efficiency and which if made by a higher animal we might be tempted to characterize as highly ingenious. The plan calls for a "platform," supported from above by trusses or braces, and anchored below by vertical threads, which constitute a trap. These threads are the sticky ones, at least at the lower ends, and they are pulled so taut that when subjected to strain they snap and contract like rubber bands. When a small roach, or a fly or a beetle comes into contact with one or more of these special threads, the strain may cause them to snap and pull the victim up where his struggles entangle him all the more. At the proper time the builder-owner, who may be sitting idly by watching her victim struggle, will haul in the line, give the victim a quieting bite and then drag him away for her next meal.

There have been observations of *Theridions* subduing, in this fashion, mice, snakes and other small animals.

Black Widow Spider

Oddly enough, *Theridion*, a perfectly harmless little old lady type of spider, has for a close relative the notorious black widow, *Latrodectus mactans*. The typical diagnostic marking of the black widow has been widely publicized. It is a bright red spot, shaped like an hourglass on the under side of the shiny black abdomen. This mark may be somewhat irregular in outline. Younger specimens and males also have yellow, red and white markings on the back.

Whereas in some spiders, the poison sacs are so small as to fit into the hollow portions of the jaws, in the black widow they are so large that they extend far back from the jaws, and hold a correspondingly larger dose of poison. The

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bite of the black widow is followed by a sharp painful sensation. In about half an hour other pains and cramps, accompanied by difficult breathing, occur. Fever may develop, along with more intense pain and delirium. Recovery may take about two weeks. The bites can be fatal, but fatal cases are rare.

Fortunately, the black widow seldom occurs in New York State outside of Long Island. In favorable locations on Long Island it is not uncommon. The preferred habitats include trash piles, wood piles, stone walls, loosely piled boards and lumber, outhouses, abandoned buildings, vents in stone and block foundations, and similar situations.

A mature female black widow may have a body as much as a half-inch in length. The males, like the males of many spiders, are small and inconsequential in appearance, compared to the females, and they do not bite. The females may attack the males after mating, but not always. This happens with many other spiders also, so the term "widow" is not so specifically appropriate as one might imagine.

Wolf Spider

Below the black widow in the painting, and represented as having just come out from under a piece of wood, or possibly just backing in under it with a victim, is *Lycosa*, a wolf spider. *Lycosa* gets along very well in its daily life without using silk, which—in the minds of most people—is commonly associated with all spiders. These spiders catch their prey, wolf-like, by chasing it and pouncing on it. A typical *Lycosa* is *Lycosa helluo*, a large velvety black or dark brown species with a leg spread of well over an inch. This is one of the types that occasionally startle country home owners when they see them on the cellar wall or under a stone or log in the garden. The female spider carries her eggs in a conspicuous round silken ball attached to the spinnerets. When they hatch the young are carried around on the mother's back for several days. These wolf spiders (fierce and fearsome as they must be according to arthropod standards) like their counterparts, the wolf and the lion, among the larger animals, are noted for their care of their young.

Turret Spider

The interesting turret spider is also a *Lycosa*. Although she has the specific name *carolinensis*, she is found over most of the United States including New York State. She digs a burrow six or eight inches deep and sometimes, but not always, builds a little tower or turret an inch or more high around its entrance. For this purpose she uses small stones, twigs, pine needles and the like, with a tube of silk as the central framework. You will probably not see her actually constructing it, since she works only at night, or when she is sure she is alone, but once it is finished you may see her at the entrance, where she waits and watches for unwary insects.

The true European tarantula is a close relative of our *Lycosa*. There are other large spiders which have come to be called tarantulas because of their size and formidable appearance. Among these are the heavy-bodied "bird spiders" of the tropics, some of which occasionally find their way north on bunches of bananas. Here we should mention also the trap-door spiders, which carry the underground tube idea to the ultimate refinement by installing a trap-door, often beautifully camouflaged, flush with the surface of the ground.

Fishing Spider

A large relative of the *Lycosa*, which lives in our area, is the fishing spider. Actually, it probably does not do much fishing, but it lives around water and has been observed to catch small minnows. One common member of this group, *Dolomedes scriptus*, is rather attractively uniformed in grey, black, buff, yellow and brown. The body of the female may measure nearly an inch in length. These spiders are common along stony creek bottoms and near cement dams. They are very alert and active, and usually they dodge their pursuers very easily. The female is sometimes handicapped in her activity by her large silken egg case, which she carries in her jaws.

Closely related to our fishing spider is the diving spider of Europe. This one actually takes an air bubble down to its nest under water, and gets its oxygen from this supply.

Returning now to our painting, we see three small spiders from New York State, each of which is noteworthy in some unique way.

Spiny-Bellied Spider

At the lower left is the spiny-bellied spider. Our specimen is *Micrathena gracilis*, which translated could mean "The graceful little Athena." These spiders characteristically have firm spiny bodies that suggest beechnuts in appearance, but with more spines. Many of them are brightly colored with yellow, green, white, and brown. They spin true orb webs, often stretched widely across a shady woodland path at shoulder height, where unless a shaft of sunlight reveals them in the nick of time, the unwary hiker may blunder into them.

Grass Spider

At the lower right of the picture we see one of the commonest of all, a grass spider or funnel weaver, *Agelena naevia*. This is the one whose sheets of silk with funnel attached are so conspicuous in the grass on dewy Summer mornings. The more or less flattened sheet of silk is rounded around the edges and tapered, funnel-like, into a tube which leads off into the deeper grass and weeds. Since the tube is open at both ends, the spider has a rear exit in case of danger at the front door. The flatter expanse of the web itself is springy or spongy so that although it looks like a good landing field it is more apt to be a boggy morass to entangle the unwary winged visitor.

The spider herself, of course, can dart lightly across the silken sheet and waylay her struggling victims. The common *Agelena naevia* is a greyish brown in color, with lighter and darker markings. Its body is rather long and narrow, and a full-grown female may be nearly an inch long.

Crab Spider

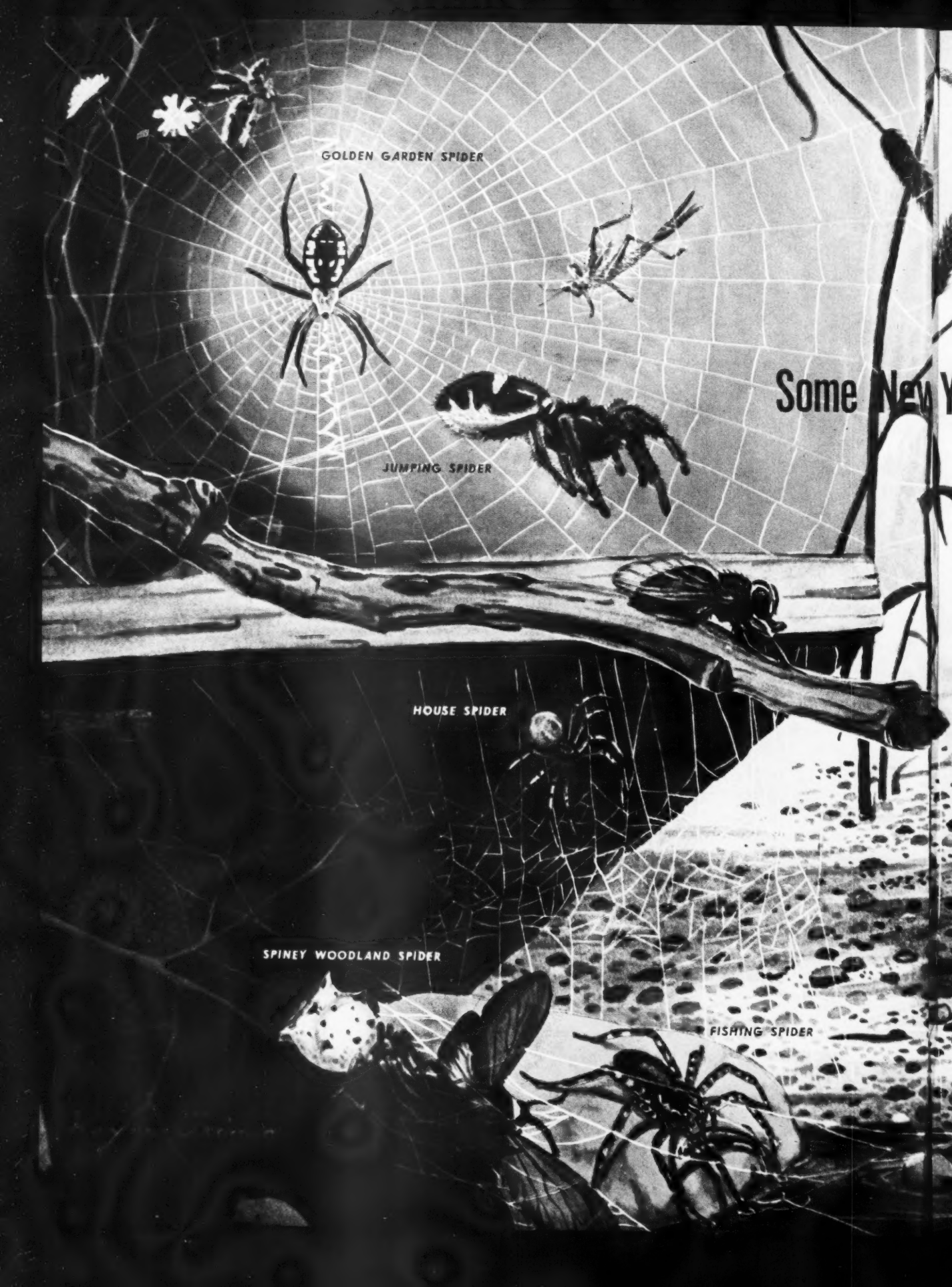
Lastly we have the beautiful and graceful crab spider, *Misumena*. *Misumena* and her close relatives are also called flower spiders. The first name refers to their characteristic crab-like shape. The second name is perhaps to be preferred, since they commonly occur on flowers and are attractively colored and marked so that when on a suitable blossom they are almost invisible. A specimen which on the white petals of a daisy may be milk white, may become yellow after a few days on goldenrod. This protective coloration is obviously a great advantage to them, since they do not spin snares but lie concealed in the flower-heads waiting to grab some unsuspecting visitors.

In the painting we have chosen to present spiders which represent a great diversity of form and specific habits. We should also mention some of the general features which most spiders have in common, or which are generally held to be characteristic of them, however much they differ in detail.

Spiders are classified as Arachnida, a class of the Arthropoda, or "jointed-leg" animals. They are *not* insects; spiders have eight legs, while insects typically have only six.

All spiders are carnivorous; they never have wings; they develop directly, with no larval or nymphal stages; they usually have six eyes or eight eyes; they have silk glands and spinning apparatus

(*Continued on page* 26)


GOLDEN GARDEN SPIDER
JUMPING SPIDER
HOUSE SPIDER
SPINEY WOODLAND SPIDER
FISHING SPIDER

York Spiders
Female
BLACK WIDOW SPIDER
Male
WOLF SPIDER
TURRET SPIDER
CRAB SPIDER
GRASS SPIDER

(*Continued from page* 23)
near the tip of the abdomen, although they differ greatly in the amount and quality of silk they produce and how they use it.

Instead of having three well-marked body regions like adult insects have, spiders have only two, since the head and thorax are fused into a unit known as the cephalothorax.

The males of many spiders are much smaller than the females, but there are also many where they are of about the same size.

Associated with the domestic life of spiders are many fascinating habits, or "behavior patterns." In some species, as in the jumping spider of our picture, the males have bright iridescent colors in front, and the front legs are decorated with plumes and other ornamentation. In courtship they dance and strut in front of the females, displaying their colors and tassels in a sort of beauty contest or fashion show, like cock pheasants and other well known dandies among the birds.

The word "silk" is immediately associated with spiders, but it is so vast a subject and has so many aspects that we can do little more than mention it here. In describing the spiders represented in our picture we have, by inference, at least, called attention to the many types of webs made by the various spiders of our State.

Attempts have been made to utilize the silk of some of our spiders in the textile industry, but although spider silk can actually be made into thread and utilized, the mechanical difficulties and the economics of the operation are such that one wonders how it could ever be imagined that it would work out.

Spider silk at one time did have a real use, however, as cross-hairs in optical instruments, such as range finders and certain types of microscopes and measuring instruments. Both our common golden garden spider and the black widow furnish silk suitable for this purpose.

Spiders have two poison glands, one on each side in the anterior portion of the cephalothorax, of head-and-neck region. Each gland discharges through a long slender tube which opens near the tip of the claw of the "chelicera" or "fang"; i.e., one of the "jaws." In the black widow these glands are comparatively large. In other species they are mostly contained within the jaw structure itself and there are various in-between conditions.

Since spiders are so often accused of biting, a word should be said about this activity. In the first place, at least in New York State, about 99.9 per cent of the "bites" attributed to spiders are actually not due to spiders at all. Some are due to various biting insects including blackflies, mosquitoes, punkies, deer flies and horse flies. Others may have really been bee stings. Some may be due to ticks or mites, others are of plant origin, like the rash from nettles, and some are various allergic reactions.

Most of our spiders could not bite through the human skin if they tried, and the few larger ones that can will not do so except under the most extreme provocation. Even then, their bites usually would be no more serious or painful than a pin prick, or at most like a bee sting. As was mentioned above, only the black widow need be really feared and in New York that is rare outside of Long Island.

Often, misinformation breeds mistrust, suspicion and fear. On closer acquaintance, or with knowledge replacing superstition, the fear or dislike may turn to appreciation and interest. Thus it can be with spiders. If you will observe more, and perhaps read a little more in several good articles and books, you may find, to your own surprise, that spiders are among the most fascinating of all our wild creatures.

Cayuga Lake Trout (*Continued from page* 15)

immediately following (i.e., April-September). Consideration of the recoveries by months thus permits the tracing of movements through a calendar year as well as showing seasonal distribution (*Figure 3*).

A widespread dispersion throughout the lake takes place by April. (The arrows indicated in the chart are purely suggestive, as there is no way of telling the exact route a fish travels between release point and recapture area.) Trout invade the western shore of the northern shoals at Canoga, showing a distinct liking for this area in early Spring. Perhaps it is the rubble paved bottom, or perhaps the early warming of the shoal water that attracts them. In any event, the duration of the fishery in this area is at the mercy of water temperature, and in a normal season is likely to end with warm weather in May. There are other areas that provide good early fishing, most of them indicated in *Figure 2*. Even within these favored areas, there are more localized "hot spots." These must be learned from experience.

June recoveries show a closing of ranks to the deeper central basin and through July and August all recoveries are made in a limited area of shoreline, roughly five miles long, extending from King Ferry northward to Willets (area IV). If Taughannock is considered traditional breeding grounds, then King Ferry qualifies as the "Summer resort" of large trout. Gill net samples throughout the lake have established the fact that large trout do not occur in substantial numbers in the remainder of the lake during July and August. The following schedule shows the number of trout taken in each of the area or sampling sections netted between 1950-55, using the same amount of netting effort in each section:

Lake Section	*Number of Trout*	
Netted	*Over 20"*	*Under 20"*
I	24	195
II	30	205
III	36	241
IV	196	311
V	12	163

It will be noted that the concentration of trout in Section IV is not comprised wholly of large trout; small trout, too, are more abundant here and in the adjoining portions of Section III. We do not know, as yet, why trout are attracted so strongly to this section of the lake at this season of the year. The bottom here has a gentler slope at depths that may be attractive to trout in Summer. Or perchance the fish may gather to partake of the sulphur waters that are reputed to well upwards into the lake in this area. (Curiously, lake trout in Seneca Lake seem oriented in an almost identical geographical position at Lodi Point during the Summer.)

September netting data must be used to furnish evidence for the return journey to Taughannock. The angling season closes so early in the month that few recaptures are available.

If the Cayuga trout were a natural, self-supporting population one might be tempted to explain their movements as an ancestral hereditary pattern. But as pointed out in an earlier article (CONSERVATIONIST, April-May, 1955), the present stock is virtually all of hatchery origin and from Seneca Lake parents. Perhaps random movements could account for attracting large numbers of trout in areas of favorable habitat, but the possibility of orienting factors cannot be ruled out. The pattern described applies only to adult trout. Recoveries of trout tagged as juveniles are less plentiful, but the indirect evidence from netting suggests they remain well scattered throughout the year (northern and southern shoals excepted). Fin-clipped hatchery fish released in Section II take about two years to disperse completely.

Record Game Fish of New York

by Cecil E. Heacox

We want to keep the list of record New York State game fish accurate and up-to-date. If there are errors or valid omissions, we would like to know about them.

Because of the similarity in appearance of many species, positive identification, even by an expert, is often difficult.

To provide a convenient clearing house for future records, the Conservation Department's Division of Conservation Education will serve as custodian of New York State angling records.

Fishermen who want to qualify a fish for a State record should have the weighing of the fish witnessed by two persons and a notarized affidavit filed with the Division of Conservation Education. Moreover, the fish should be frozen and held until checked by a Department representative.

In looking over the list, that popular species, the chain pickerel, (Esox niger) is conspicuous by its absence.

As custodian, this is a good starting point for the Division of Conservation Education. The accepted world's record for pickerel, incidentally, is a 10-pound, 10-ounce specimen caught in a Canadian Lake.

A New York State record pickerel, anyone?—Editor

NEW York State waters hold some mighty big fish. That's one of the reasons there are a million enthusiastic fishermen in the Empire State.

Since the previous list of New York State record big fish was published in THE CONSERVATIONIST in 1946, four new records have been established: Brown trout (21 lbs., 5 oz.), walleyed pike (15 lbs., 3 oz.), Chautauqua muskalonge (51 lbs., 3 oz.) and St. Lawrence muskalonge (69 lbs., 15 oz.).

That St. Lawrence muskie also sets a new world's record. Last Fall, Arthur Lawton topped his own State record (58 lbs., 5 oz.) with a whopper just one ounce short of 70 pounds!

Another New York State World's record is a northern pike (46 lbs., 2 oz.) caught in Sacandaga Reservoir in 1940 by Peter Dubuc. Mr. Dubuc is also the co-holder of the State record for largemouth bass (10 lbs., 6 oz.).

One record still stands after 50 years —the 8-pound, 8-ounce brook trout taken in 1908 in Punchbowl Pond, Sullivan County, by William Keener. But Department fisheries men feel this record, too, may be surpassed sometime. Although most of the State records are held by men, the distaff side can be proud of Blanche Baker and her 15-pound, 3-ounce walleyed pike.

When the 1946 list was published, landlocked salmon didn't seem abundant enough or big enough to qualify for a place on the list. But, in the meantime, the Conservation Department's management program has paid off handsomely. A 16-pound, 14-ounce salmon caught in Lake George last Spring, certainly deserves a place of honor.

Tomorrow will bring bigger fish but here's New York's record fish today*:

Common Name	*Scientific Name*	*Weight*	*Year Taken*	*Place Caught*	*Angler*
Brook Trout	*Salvelinus fontinalis*	8 lbs., 8 oz.	1908	Punchbowl Lake, Sullivan County	William Keener
Brown Trout	*Salmo trutta*	21 lbs., 5 oz.	1954	Owasco Lake, Cayuga County	Thomas Klink
Rainbow Trout	*Salmo gairdneri*	21 lbs.	1946	Keuka Lake, Steuben County	Earl G. Crane
Lake Trout	*Cristivomer namaycush*	31 lbs.	1922	Follensby Pond, Franklin County	Malcolm Hain
Salmon	*Salmo salar*	16 lbs., 14 oz.	1958	Lake George, Warren County	Neil Hughes
Smallmouth Bass	*Micropterus dolomieu*	9 lbs.	1925	Friends Lake Outlet, Warren Co.	George Tennyson
Largemouth Bass	*Micropterus salmoides*	10 lbs., 6 oz.	1931 1942	Rensselaer Co. Pond, Sacandaga Reservoir	J. L. Reed Peter Dubuc
Walleyed Pike	*Stizostedian vitreum*	15 lbs., 3 oz.	1952	Chemung River, Chemung County	Blanche Baker
Northern Pike	*Lsox lucius*	46 lbs., 2 oz.	1940	Sacandaga Reservoir, Saratoga County	Peter Dubuc
Muskalonge (St. Lawrence)	*Esox masquinongy*	69 lbs., 15 oz.	1957	St. Lawrence River, St. Lawrence County	Arthur Lawton
Muskalonge (Chautauqua)	*Esox masquinongy ohiensis*	51 lbs., 3 oz.	1955	Chautauqua Lake, Chautauqua County	George Smith

*As of June 30, 1958.

The Bark Peelers

by Lee S. Trimi

"GET a move on there, before I tan your hide!"

Ever hear that expression? If you are old enough, you almost certainly have heard it. In fact, your recollection may be sharpened by the memory of more than assailed your ears. In any event, there was a time here in New York, when the tanning of hides was an important industry. And so was the production of tan bark upon which the tanning industry depended. Tan bark, in turn, was a by-product of the lumber industry and up to 1895, one of its most profitable sources of income.

Hemlock tan bark was used in the tanning and production of about 80 per cent of all leather goods. Oak bark was actually better but was in such short supply that it could be used for only the most select leathers.

Hemlock lumber was so cheap at the time that it scarcely paid the cost of handling. In 1897 the price of rough, run-of-the-mill lumber was a low $6 per thousand feet. During the Spanish-American War, however, the price advanced to $8 a thousand and a year later prices jumped to $12, sparking the greatest boom the industry had ever known.

Mills doubled and trebled their output. Companies that had been on the brink of bankruptcy made undreamed of profits. Larger companies added to their timber holdings and built railroads into remote forest sections. Mill towns grew rapidly and became centers of civic interest. Schools, churches and places of entertainment were furnished by the mill company which also owned the stores, the land and the town.

Mills were dependent on peeled hemlock logs for their output of run-of-the-mill rough lumber, so the demand for bark peelers was great. These men were drawn mostly from among up-state farmers or those familiar with forest life. An attempt to introduce immigrant labor was a dismal failure except for those from Norway and Sweden who adjusted readily to their new environment and became skilled woodsmen.

It was customary for companies to build rough board shacks or camps in whatever section of timber they wished cut. Such shacks had no permanent foundations and could be moved to new locations deeper in the woods as the cutting necessitated. Camps consisted of one large building, two stories high which housed the foreman, and his family, the office and whatever help was needed to prepare meals and feed the woodsmen. The woodsmen lived in a separate building with double-decked bunks along its sides and rough wooden benches for furniture. There was little comfort and even less privacy. The cooks and the girls who prepared and served meals lived in the boarding house and were under supervision of the foreman's wife. The foreman was camp boss with authority to hire or fire anyone he chose. It was he who laid out the work and made the rules.

The bark peelers operated in a well organized fashion. The tract to be worked was first divided into "bark roads." These were strips—200 feet wide—which began at the railroad, river or large creek in the valley and ran back into the forest as far as the company wished to cut that year. They were marked only by blazed trees. Each peeling crew was assigned a road.

It was the duty of every crew to guard the safety of workers on adjoining bark roads when felling timber. Each felled their trees parallel to the "road" as much as it was possible to do so. This left the center clear for hauling logs and bark down to the valley.

A bark peeling crew consisted of three men. The first was the "spudder" who peeled bark from the trees and bossed the crew. It was he who set the pace for work accomplished. The other two felled the trees and got them ready for the spudder. This was done by cutting rings through the bark, four feet apart, and by cutting off all the limbs. The second man, who did this job, was called the "fitter." Third man of the crew was the "ax man."

He determined which trees were to be cut, notched them with his ax so they would fall just right and was responsible for the safety of his crew. He warned of all limbs that might be torn off and left hanging in other trees. These were known as "widow makers" and were the greatest hazard faced by bark peelers. The ax man was not only skilled with an ax, but needed to know more about timber than any man in the crew.

A working crew would proceed in this manner: Before starting to cut the notch, they took off a four-foot ring of bark known as the "butt ring." After the notch was cut, ax man and fitter sawed through the tree toward the notch until the tree was ready to fall. The cry of "timber!" alerted everyone to the danger of the falling tree. So expert were these men that they could fell a tree within a foot or so of any given point. Crews took great pride in their work—both as to the volume they could turn out and to the quality of their workmanship. It was not unusual to hear the ax man say, after cutting the guiding notch in a tree, "Let other generations look that over!"

The spudder's boast was of how fast he chased the fitter up the log and of calling for more timber. But the prowess of each crew rested in its ax man. You could get a bet at any time by saying, "Our ax man can take the heart away from any man in camp."

To a woodsman there was no sport equal to such a contest. The rivals were experts using double-bitted axes, each having ground and honed the blade to his liking. The tree chosen was usually a large one, and after the butt ring was removed, each chose the side he preferred to chop. After this was decided the foreman gave a signal and the battle was on. The ax man whose notch was nearest the heart of the tree when it fell was declared the winner. This was not so much a matter of strength as of skill. Gripping the ax helve much as a batter grips his bat, swinging at full arm's length any interruption in rhythm could determine the outcome. The element of chance was great enough to make it a good gamble and betting was heavy.

The main topic of discussion at night was of individual skills, problems faced and dangers avoided. Woodsmen had their own code of honor and the men seldom complained of difficulties; that would have been tantamount to an alibi for failure.

Drinking liquor was not tolerated in camp but there was no restriction on how much a workman drank while in town or on how drunk he might be when he returned. Crews seldom left camp except on Saturdays.

There was little fraternizing between men and girls while in camp. Most girls working at the camp were from the mill town nearby and had members of the family among the working crews. If a man wanted a date with a girl he usually asked her to a dance in the mill town where she lived.

Among woodsmen—none noted for polished manners—the spudder was considered to be the roughest and toughest. His sense of humor was crude and often coarse. A man who complained of minor injuries or fatigue was made the butt of ridicule. For example, in a section infested by rattlesnakes, one who showed signs of fear was treated with contempt.

In one such camp a young man's fear became so evident that he became the victim of a cruel joke. It was a sport on Sunday for the men to go to a rattlesnake den and kill as many rattlers as they could. On this particular day they brought a live snake back to camp. After teasing the boy with it, they killed the snake, removing the rattles and put them on a string. That night as the lad sat on his bunk, someone yelled "Snake!" and rattled the string near him. Simultaneously a man in the bunk above dropped the dead snake around the youngster's neck. The boy became frantic, bolted for the door, bowling over two men in his way and sought sanctuary in the foreman's house for the night. The story might well end there, but two weeks later, while drawing out bark, the boy picked up an armful and a snake rattled. He dropped the bark and ran to camp, leaving his team in the woods. He packed his belongings, left camp and did not return.

The bark peeling began in the Spring; usually running from April 1 to July 10. Work hours were 6:30 a.m. to 6 p.m. which left little time for relaxation. Leisure was not on the schedule nor did the men know the meaning of overtime pay. They drew larger wages, worked harder and ate better than any other men in the industry so had no complaints. Occasionally crews played cards as a pastime, but the men were not keen for this form of gambling. They believed that the only honest money was that earned by physical labor.

If a workman became injured or ill he was treated by the company doctor. There was a bond between man and company in which money was not a factor. To tell a woodsman he was exploited would have been an insult as great as questioning the quality of his work. He challenged anyone who spoke lightly of the company for which he worked.

The Fourth of July was the greatest day in the year for the bark peeler. It was near the end of his working season and each planned and saved for the big event. Every camp was deserted and would remain so for a week. There were dances to attend, girls to meet and dreams to be realized. Money was no object for there was more cash in pockets now than many would see again for a year. Most took excursions to large towns where they could buy drinks and display their cash. They were wild men from the forests on the prowl.

Returning to camp, they found it taken over by lumberjacks. There were log cutters, teamsters and log rollers. Bark roads now became log roads and there was intense activity getting the logs to the mill. Huge skidways of logs were built along the railroad or on banks of rivers or large creeks for hauling or floating timber to the mill.

Lumbering activity would continue until the first snow, when crews disbanded and teams were sent to Winter stables in the mill town and the camp closed.

With another Spring the bark peelers with their axes and spuds gathered for another bout with the forest which to them seemed inexhaustible. To these men, forests grew only to be cut and they knew themselves to be the best in the trade.

Near Croghan, about 1890. Note gabled piles of hemlock bark

Burrow damage causes erosion; "sluffing off" of dike

by Arthur H. Cook,
Game Research Investigator

Muskrat Damage Control

MOTHER Nature has brief affection for water areas. Following their creation, she works tirelessly to destroy them. One of her most effective agents in this destruction, especially of man-made impoundments, such as fish ponds and wildlife marshes, is the muskrat. Now, beaver have long enjoyed the distinction in the animal world of being first prize winners in the hydraulic engineering department—and they certainly merit that award. But when it comes to underwater excavation, the smart beaver steps aside and leaves it to cousin muskrat. Muskrats build very nice rush homes in marshes, it's true, but a really happy muskrat is one that's just located a nice water's edge mud bank. There's no question of what to do—he digs a hole in it! And being socially minded he passes the word around to his cronies. They are prompt to accept his invitation. They all show up and they all dig holes too.

We have nothing against the muskrat. He is our most valuable furbearer and many a farm boy, even today, would be hard pressed for clothes and spending money were it not for muskrat trapping profits. No, muskrats are fine and we like to see them happily digging holes. Trouble is, they insist upon digging their holes in the dikes and dams constructed by man in our increasingly important program of putting water on the land. This poses no small problem. There are to date in this country, more than two million fresh water impoundments and the rate of development is increasing rapidly. In New York State alone, Soil Conservation Service co-operators have built more than 9,700 farm ponds, and other landowners, in co-operation with the Conservation Department, have constructed more than 900 small wildlife marshes. The problems involved in construction of these small water impoundments have been pretty well solved. But maintenance—that's a different story; thanks in large measure to our champion underwater burrower, the muskrat. It's no exaggeration to say that the long-range success of this program of conservationists to create small water impoundments on the land depends, in no small measure, upon the development of effective muskrat burrow damage controls.

Investigation of this problem and the testing of various control measures have been important phases of the Conservation Department's work in furbearer studies conducted under the Pittman-Robertson Program*. Among the earliest avenues of investigation was the association of availability of food in relation to muskrat burrowing activity. "Eliminate the muskrat's food supply in the vicinity of the dam" is, perhaps, the most commonly heard procedure for reducing burrow damage. Is this a sound approach? For an answer we explored the muskrat's capabilities to secure food during the animal's most critical period —the Winter. Muskrats, when submerged, can swim at about two miles an hour or approximately 60 yards a minute. They may remain under water for as long as 13 minutes. Thus, it is apparent that a reduction of vegetation in the vicinity of man-made dams represents no real obstacle for the muskrat. He simply swims further from his bank burrow to the source of his food supply.

We may turn to an alternate plan and declare that the *muskrat must go.* It's possible, theoretically, to wipe out a muskrat population of any specific area by trapping, but any experienced trapper will testify that it is somewhat more than a man-sized job to catch the last few. Moreover, we may expect rapid replacements of muskrats taken in such trapping operations. To maintain a muskrat-free water area would require contant vigil and an outlay of time and effort vastly greater than could be expected of most landowners.

Another control method often recommended is earth compaction with a sheepsfoot roller at the time of dam construction. This sounds logical since we may assume that tightly compacted earth would be hard enough to discourage these burrowing rodents. But muskrats, as we've pointed out, are champion diggers and they're not swayed in the slightest by human logic. In spite of numerous efforts to control their activities by earth compaction, about as many burrows were dug in dikes that had the benefit of a sheepsfoot roller as in those that were not rolled.

During the days of the Civilian Conservation Corps, a rather large number of State-owned earthen dams were rip-rapped, as a control measure against burrowing, with field stone. But within ten years muskrats had burrowed into dams so treated at the State Game Farm, Delmar. Now, twenty-five years later, numerous burrows may be seen in dams similarly rip-rapped at the Howland's Island Game Management Area. This expensive precaution does not seem to be justified if and when muskrat-burrow damage is the sole consideration. If stone rip-rapping didn't work, perhaps, we thought, it was the fault of the material used rather than the theory. So we

In these studies, the author wishes to acknowledge the assistance of David G. Allen, Laboratory of Ornithology, Cornell University, The National Gypsum Company, Buffalo, and especially that of Donald Spittler and Richard Reynolds, New York State Conservation Department.

** This article is based on studies conducted by the Conservation Department under the P.-R. (Federal Aid in Wildlife Restoration) Program.*

Muskrat burrow damage — downstream side of dike

Muskrat burrow showing tendency for 'rat to dig in a way, then up

tried other sheathing materials which could be applied to the face of dams where serious damage had occurred or was apt to occur. For this, hardware cloth, poultry netting and aluminum mesh were used. Hardware cloth has remained an effective barrier for about five years providing it had been applied to the face of a dam which was free from burrows. If active burrows were present, muskrats tunnelled under this protective mat and continued their destructive digging. It is virtually impossible to eliminate the muskrats by "digging them out," and furthermore, the cost of such a course of action is prohibitive.

Poultry netting (19 gauge) served only as a short-lived barrier. There was some evidence, although inconclusive, that muskrats had actually gnawed through this material to gain entrance into the dam.

Aluminum mesh, because of its weight, would have been the most efficient material tested if it could have withstood the somewhat extreme chemical conditions encountered in the water-logged soils of our marshes. It deteriorated seriously, however, at a test site in an acid, organic soil, in about six months.

The use of relatively inexpensive, light weight, metal barriers thus must be considered of temporary value because of their high rate of deterioration in or on soil, in about six months.

Thus far we've reviewed a number of hoped-for remedies that have added up to no more than tears and toil. Now let's talk about a couple of more recent developments that show great promise and are actually in successful operation. The first of these evolved as a consequence of observation of many natural and man-made water areas where—eventually—something that we had been looking at right along clicked into focus: We noted that muskrats did not burrow at locations where a level shelf of earth, or berm, projected into the water *at water level.* Now this makes sense from the muskrat's point of view. Here's why—they love to dig tunnels, sometimes, it seems, just for the fun of digging but actually they aren't digging at random; they have a plan in mind. They start digging into a bank (dam, dike or what have you) below the water level. After they've made progress forward a ways, (the distance varies dependent upon the nature and density of the soil) they do a 90 degree—plus or minus—turn vertically and dig upward until their tunnel is above the water level. As soon as their hind feet are comfortably out of the water they turn their attention to enlarging their burrow into a living chamber. Now let's apply this pattern to a berm. The muskrat begins operation below water level at the face of the berm; he digs straight in according to Hoyle, then starts digging upward. First thing he knows he has tunnelled right out on top the berm and his feet are still in the water. And even though he may not tunnel all the way to the top, there's so little soil overhead that the roof of his chamber collapses. The high I.Q. muskrat realizes at once that here is a situation that doesn't fit into the engineering specifications he'd been taught—and off he goes to another site with more headroom. Even the stupid muskrats get the idea after a few tries and they too pull up stakes for happier digging grounds.

These observations were put to a test in the construction of five 48-D marsh dams, each with the berm feature added. Now, five years later, none of the dams with berms has been damaged by muskrats except for portions where no berm could be constructed; as for example, behind the concrete spillway. Berms seem to be an equally effective measure for protecting dikes in certain situations. When emergency spillways must be large to meet engineering specifications, earth in excess of that needed for the dam may be available. Under such conditions the construction of a berm 10 to 14 feet wide at water level and as an integral part of the dam has merit.

The second practical damage control structure tried out thus far involves the use of vertical barriers placed within, but as close to the leading edge or face of the dam as is feasible. For this barrier, thin, relatively flexible sheets (4 feet high x 8 feet long) of asbestos-cement are recommended. The composition of this material probably would not be changed by the chemistry of water-logged soils normally encountered in fresh-water impoundments in the Northeast. Its hardness is thought to be increased by close association with water and the effective life expectancy of this material should be great because of its relatively inert nature. To install such a barrier, a vertical trench four feet deep should be dug along the facing edge of the dam in such a manner as to place the base of the trench two feet below the normal water level. The asbestos-cement sheets, butted tightly against one another, are then set into the trench, staked flush against the ditch wall on the water side and the trench backfilled with earth. Thus the asbestos-cement barrier would be positioned to extend two feet above and two feet below the normal water level. Placement in this manner insures a reasonable safety factor as it is unlikely that muskrats would burrow under this barrier, and if they attempted to go over it, their burrows would be at the surface and of little value to them.

An Adirondack Adventure in

HAD you been in the area of the outlet of Harrisburg Lake in the Town of Stony Creek in Warren County one day in 1939, you would have seen the awe-inspiring strength and force of nature on a rampage. It was one of those nice, warm, early Spring days, when the combined pressure of the build-up of floe ice and Spring run-off water proved to be too much for the man-made dam across Harrisburg Creek. With a grinding roar the dam went out and with it, just as though someone had pulled the cork of a giant bottle, went most of the water of Harrisburg Lake. In a matter of hours, a fine trout fishery of some 283 acres was drained down to a 32-acre shallow pond with a shoreline made up mostly of mud flats, exposed pond grasses and weeds, sunken logs and uncovered stumps and snags.

No one was near the dam site when the disaster took place and, in fact, no one had bothered about the old dam in years. It had been there as far back as the older residents could remember and seemed to be about as permanent a land feature as the surrounding pine- and hemlock-covered mountains and hills. The dam had been built in a narrow-gorge-like cut years before to store water to flush logs down to East Stony Creek, the Sacandaga River and finally to the Hudson River with its many mills and paper plants.

In the lake itself and the tributary cold mountain streams the native Adirondack speckled trout was completely at home and multiplied freely. Ed. Streever, a long-time Warren County resident, spent many of his early years in the Harrisburg Lake section, and remembers the log drives as well as the fishing. He remembers one of the nicest Adirondack brookies he ever caught was a 4½-pounder taken just below the dam and it was no trouble at all to catch a couple of frying pans full right off the shore in front of his camp in those days. In addition, the wily brown trout (Ed. remembers seeing an 8½-pound brown caught in the northern tributary) and a few fighting rainbows gave variety to the fishermen's day. In the Fall and Spring large flocks of puddle ducks stopped off on their migration voyage to feed in the shallow marsh tributary fringes and other groups of diving ducks found the deeper channel beds good stopping-off places while travelling. All the water-loving mammals were present and trappers yearly took good catches of mink, otter and muskrat along its shores. Deer and bear came to the shores in abundance as did all the other woods animals that love North Country woods-surrounded lakes and ponds. Of course, when the lake drained off, the numerous wildlife decreased in proportion to their need for water and the amount of water available in the "new" pond. Ducks still stopped off but only small groups and most of the diving ducks passed on by.

But the really depressing change was in the fish life of the pond. With a two- to four-foot water level, the cold waters quickly warmed up and as the waters warmed the trout moved out. Gradually, working their way up stream from the great Sacandaga Reservoir to the south, perch and pickerel found their way into the old trout waters. Both did very well indeed as weed beds began to spread in the shallow warm water. But the crowning blow of all to Harrisburg Lake as a game fish body of water came when carp made their appearance. No one knows for sure how they got into the lake. It just seemed that one day someone caught one and almost overnight carp were everywhere and about all that could be caught. A sad, sad story to the fishermen who knew the lake "when." In fact, except for a little carp spearing, no one bothered about Harrisburg Lake.

So it went for some fifteen years until 1954 when the Stony Creek Rod and Gun Club was organized. It was at one of the early meetings that the old timers got to talking about the "good old days" in Harrisburg Lake. One thing led to another and the president, Grant Richards, a local electrical contractor, appointed a committee to investigate the dam site and consider the possibility of replacing the dam. At the next club meeting the committee showed up pretty discouraged and reported that the dam could be replaced all right but at a cost in labor and materials far beyond the club's ability to pay. It was in the face of this discouragement that Town Supervisor Dewitt Tremaine suggested the project be laid before the Warren County Conservation Council.

Warren County is almost entirely within the Adirondack Park of our State and has always been conservation-minded. The Board of Supervisors regularly appropriates funds for conservation work in the county and looks to the Warren County Conservation Council for recommendations of suitable and proper projects on which to spend these allocated funds. The Board also holds the Conservation Council responsible for successfully carrying through any project for which such funds are allocated. In this way, the county is sure that funds are used properly for projects of benefit to the county as a whole.

Well, when Richards and Dewitt Tremaine proposed to the County Council that it support the project to rebuild the Harrisburg Lake dam, there was considerable excitement and discussion. It was a big project, the cost was high (it finally cost $3,500 for the construction of the dam alone), it would require a great deal of preliminary work at the site—property rights releases, leases, etc., would have to be obtained, and the State Conservation Department would have to issue a permit and handle the clearing of the rough fish population then in the pond. Yes, the problems were big even for the Council to tackle, but Julian Beaudet of Lake George, president of the County Council, sent the delegates back to their home town clubs that evening with instructions to discuss the Stony Creek club's project and return to their next meeting instructed on how each town felt about the County Council undertaking such a project.

At the next meeting the vote was 100 per cent for it, and Project Committee Chairmen Tremaine and Richards went to work getting releases from shore owners to raise the lake level. With the help of Robert G. Zilliox, Adirondack District Fisheries Manager, for the New York State Conservation Department, the County Council obtained permission to build the dam. Zilliox also agreed to lead a crew of his men in the clearing of the pond of trash fish, and later to stock the newly-recreated lake with 100 legal-sized brook trout per acre in the Spring of 1956. With visions of some real old time trout fishing ahead, the Council earmarked funds for the project out of the 1955 and 1956 budgets and the Stony Creek club asked for bids from contractors to do the construction.

The actual dam site is owned by a lumber company and before county funds could be spent it had to be acquired or a long-term lease obtained. The persuasive efforts of Richards and Tremaine resulted in the lumber company agreeing to a 60-year non-cancellable lease to the club for the dam site with first option to buy should the company wish to sell. In addition, a lakeside lot 150x300 for public access to the new lake was set aside in the lease. By the time all clearances and arrangements had been made, just one year had passed from the time the Stony Creek club first discussed the project at a club meeting, but in October of

Conservation by Bill Roden

1955 things started popping.

A Warren County contractor and noted sportsman, Del. Hammond, moved in his heavy equipment including two shovels, four trucks and a bulldozer, and started to work closing off the lake outlet. Carpenters constructed and set the 22-foot crib spillway. The dam itself was to be a 10-foot high earth and rock barrier 250 feet long. As soon as Del. had closed off the outlet Zilliox and his Adirondack District fisheries men moved in to reclaim the pond by removing the rough fish.

To the conservationists and sportsmen of the Stony Creek Rod and Gun Club who pitched in to help, this was the most interesting and back-breaking part of the whole project. Biologists Zilliox, Pfeiffer, Flick, Brewer, Taylor and Lord of the Conservation Department first treated the "resident 32-acre pond" with emulsifiable rotenone—5 per cent used at a concentration of 1.0 ppm. The pond, itself, was easy and was completed in one day from a boat using power pumping equipment. From then on though, it got really tough and for four and a half days the Department men aided by Stony Creek sportsmen hand pumped the rotenone solution throughout some 250 marshy and swampy acres of the lake to be, as well as tributaries and springs feeding into the area. As Zilliox reported later: "Heavily beavered tributaries, making for impoundments and flooded swampy areas as well as the swamp and boggy nature of shoreline of the lake proper make it one of the most difficult and arduous ponds to reclaim to date." When the rotenone began to take effect, fish by the thousands came to the surface including yellow perch, chain pickerel, carp, bullheads, shiners, suckers, minnows and sunfish. The largest were some 10-pound carp.

While the Conservation Department reclamation project was in progress, the construction people were proceeding with the dam. And then—almost a disaster! The Adirondacks caught the fringes of the heavy rains that caused so much flood damage in Pennsylvania and southern New York, and overnight the placid stream at the dam site became a torrent pounding over the uncompleted barrier. The raging waters began to wash away the start of the dam. Del. Hammond mustered more men and trucks and in spite of the rain kept the earth and rocks moving out of the fill pit to the dam site and after about 24 hours the water level dropped and the danger was past. The dam was completed in early November and the lake backed up completely before the deep Adirondack Winter freeze closed in. The last "chore" in connection with the project was completed on the ice during the Winter when the Stony Creek Rod and Gun Club cut the remaining brush at ice level. This means that all brush, trees, etc., will be under at least two feet of water when the splash boards are in the spillway and the lake is at normal level.

A before and after view—Harrisburg Creek, above, becomes Harrisburg Lake, below

As to the future of the lake for fishing, District Fisheries Manager Zilliox says we've got a double insurance of good game fishing. "The best guide, of course, is what 'used to be'," he says. "Reports indicate Harrisburg Lake used to provide trout fishing, so it is logical to believe it will do so in the future. The Conservation Department stocking policy will be 5,000 brook trout fingerlings annually, with the stocking of legal fish in the Spring of 1956 in order to provide immediate angling returns. If undesirable fish such as carp, pickerel, and perch reappear, then trout stocking should be discontinued. In this case, largemouth bass would appear to be a reasonable introduction."

As to the future of waterfowl at the lake, Adirondack District Game Manager Greenleaf Chase feels: "In terms of resting and stop-over more waterfowl, particularly woodies and blacks, will use it because of larger water area and feeding beds. Nesting habitat likewise will be increased and the addition of woodduck nest boxes should greatly augment the breeding potential." (Stony Creek club built these last Winter.) "Little need be done for blackies. They will seek out sedge and alder runs of which there are ample. Harrisburg Lake should be a useful addition to waterfowl habitat," Chase adds.

The story I have told here I imagine sounds a little "prideful." It should because all of us here in Warren County are proud of completing a big project with very real conservation values leading to better fishing, hunting and trapping in our county. Aside from the conservation aspects of the project, we feel a splendid job was accomplished in bringing the various elements and organizations together in a joint project for the benefit of all the county. The Stony Creek Rod and Gun Club conceiving the idea and carrying it through; the County Conservation Council and its member clubs supplying the work and planning; the Board of Supervisors supplying the money and approval, and the New York State Conservation Department supplying the technicians and know-how—all working together in harmony to complete a project of major proportions.

We feel fortunate living in a great natural outdoor paradise; in a community and in a county where political officials are as interested in its preservation as are the sportsmen. Come and fish Harrisburg Lake soon!

the back of the book

Pollution abatement

A plan for water pollution abatement has been approved by the State Water Pollution Control Board for the Lake Champlain Drainage Basin.

The plan recommends specific steps by 13 industries, 12 villages and three hamlets to bring the water of the Basin up to the standards established for them.

The next step in the program to clean up pollution in the Basin will be meetings between Board representatives and officials of the various municipalities and industries to discuss means of correcting the conditions noted in the reports. Before the plan was adopted it was submitted to the individual polluters for their comments.

The pollution abatement plan is based on official classifications of the waters within the Drainage Basin. The Basin was officially classified by the Board on Dec. 31, 1956. Before the official classification was established, extensive surveys of the waters were made and public hearings were held in the areas.

Lake George, a part of the Champlain Basin, and all its tributary waters has been asigned AA (special) classification which prohibits the discharge of any waste effluents into its surface waters.

In 1957 the State Legislature passed a law which will retain the Lake George Special Law as a permanent enactment and which places the responsibility for enforcing the law against pollution of lake waters with local boards of health.

Field dog trials

The Conservation Department's field trial areas will again play host to a number of national, regional and local trials. For those who are interested, here is the schedule. More specific information can be secured from the District Game Manager in charge of the Game Management Area.

Three Rivers G.M.A. (near Baldwinsville)—Sept. 6-7, Pathfinder Amateur; Sept. 19-21, Brittany Spaniels; Sept. 27-28, Weimaraners; Oct. 2-5, National Pheasant Dog Shooting Championship; Oct. 9-11, American Field Dog Futurity; Oct. 12-15, National Open Pheasant Dog Championship; Nov. 15-16, Middle Atlantic Shorthair Regional Championship.

Pharsalia G.M.A. (near Norwich)—Oct. 24, 25, 26, Grand National Grouse Dog Championship.

Oak Orchard G.M.A. (near Oakfield)—Sept. 5-7, A.K.C. Licensed Retriever Trial, rounds out a season of seven local and regional trials.

For those interested in field dog trials, the Department has a pamphlet, available upon request, outlining the Conservation Department's role in this increasingly important sport.

"Litterbugs" beware

On July 1 this year a new law became effective to discourage careless and thoughtless people who deposit trash and refuse along our highways. This law makes it an offense for anyone to throw or dump refuse of any kind on any highway or on private lands adjoining the highway. Upon conviction, a "litterbug" can be fined up to $50, or sent to jail for up to 15 days, or both. Penalties increase, too, with subsequent convictions.

One of the most familiar complaints to the Conservation Department is that of the landowner whose property is littered with beer cans, bottles and papers left behind by thoughtless hunters or fishermen. Not infrequently it's the "last straw" that causes a landowner to post his land against trespass. One of the places this happens most often is on property bordering highways where hunters and fishermen park their cars.

The aim of this law is good. We hope it hits the mark.

Can't win

In May, 1958 we received a request from a farmer asking that our District wildlife control man trap foxes which were reportedly taking chickens left out over night. No sooner had our trapper started operations than we received a complaint from a neighboring farmer. This one—an orchardist—entered a plea that we stop our fox trapping operations inasmuch as he appreciated the vermin control the foxes were exercising in his orchard!—A. S. TAORMINA, *Dist. Game Mgr., Syracuse*

Surprise

Cecil Gotts, State Trapper in North Central New York, spends quite a bit of time on his coyote trap line and during his tours he collects coyote "scats" or droppings for analysis on food habits of these animals.

Recently he collected some two dozen, each in a separate paper bag labeled with the field information, and had left them neatly arranged in a box in his jeep. He stopped in Boonville for lunch and when he returned the packages were gone.

It would have been interesting to have observed the "lifter" as he examined his "loot."

Arthur Jenks

Arthur Jenks, 76 years of age, who died on April 22, 1958 in Schroon Lake, was one of the first, if not the first, Forest Fire Observer on Makomis Mountain in 1911. Mr. Jenks built the first wooden tower and the small camp on the summit and was Observer there for one Summer.

Mrs. Jenks recalls that the wooden tower and camp was struck by lightning and both burned, within a few years. Shortly thereafter the present steel tower was built.

Mr. Jenks' memories of those early days as Observer furnished many interesting and helpful anecdotes for those who succeeded him and his host of friends in his community. — ERNEST HANMER, *Forest Ranger, Blue Ridge*

Banding report

Most everyone had a joust with really rugged weather this past Winter. This was especially true for the game biologists who catch and band waterfowl. During any Winter they have to be a hardy clan.

But despite the most severe weather dealt out in many a year, the waterfowl banders made real progress with a total of 6,513 birds live-trapped, examined, banded and released. The tabulations have just been completed and the following gives a brief summary of the results:

Canvasback, 2,438; redhead, 1,301; black, 1,106; Canada geese, 513; greater scaup, 505; lesser scaup, 263; mallard, 184; bufflehead, 127; baldpate, 36; ringneck, 21; goldeneye, 10; coot, 6; pintail, 1; and old squaw, 1.

The emphasis for the past several years has been on diving duck species and even 'though more difficult to trap, the results have been excellent.

The success of the program has been due in no small part to the co-operative efforts of persons and groups outside the Conservation Department who have a sincere interest in waterfowl management. Of the eleven stations operated, three were handled by sportsmen club co-operators. These were the Canandaigua Duck Hunters, Inc., Canandaigua Lake; the Northern Chautauqua Conservation Club, Dunkirk Harbor on Lake Erie; and the Oswego Waterford Association, Oswego Harbor, Lake Ontario. The remaining eight stations were operated by Conservation Department or U.S. Fish and Wildlife Service and associated personnel.

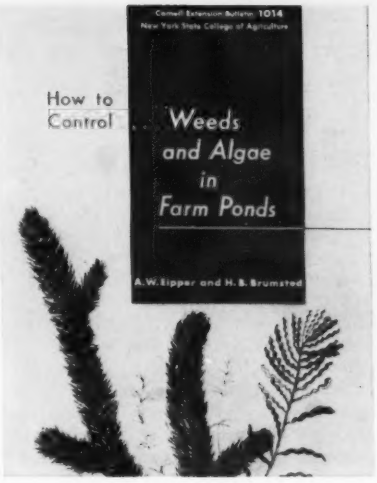
Plans are in the making even now for operation this coming Winter—with a weather eye to the long range forecast.

Industry and conservation

It is gratifying to see more and more industries, dependent on good conservation practices for their raw materials, including in their advertising programs public service messages on good conservation measures. Some, such as the oil and timber industries, have a continuing series of such advertisements that not only help promote their products, but, in addition, let the public know that in their utilization of natural resources, they are conservation-minded.

This type of advertising reaches a tremendous part of the Nation's population through widely read news media. Such public advertising service often reaches those to whom state, Federal and private conservation publications are quite unavailable.

Certainly these industries are to be commended for their real interest in natural resource conservation.


Cornell Extension Bulletin 1014
New York State College of Agriculture
How to Control
Weeds and Algae in Farm Ponds
A. W. Eipper and H. B. Brumsted

Waterweed control

Farm ponds and small marshes have become increasingly popular in New York State during the past two decades and more are being constructed each year. With people becoming ever more water conscious, the usefulness of these impoundments for ready supplies of water for livestock, irrigation, crop spraying, fire protection and year 'round recreation is proven beyond a doubt.

One of the biggest disappointments to the owners of such ponds is to find, not long after impoundment, that the water becomes choked with weeds and algae; unsightly and sometimes unusable for the purpose intended.

For all such suffering souls there's good news—a new bulletin published by Cornell University at the College of Agriculture Extension Service (Bulletin 1014), "How to Control Weeds and Algae in Farm Ponds." Doctors Eipper and Brumsted, co-authors of this new publication, have made an intensive study of this problem and approach the subject of cause and control from several angles.

If you are thinking of building a pond you should by all means get this bulletin, for it points out several construction features which will help to guard against excessive growth of aquatic plants. But even if you now have a pond and it's full of weeds, you won't want to miss their suggestions and recommendations for do-it-yourself control methods. Individual copies may be secured free of charge by writing to the New York State College of Agriculture, Extension Service, Ithaca.

Metal lures — shine

Corroded metal lures and spinners will take on a new shine if you soak them in the water from boiled potatoes.

Commercial catch

U.S. commercial fishermen caught less and earned less in 1957, according to a U.S. Fish and Wildlife Service report. The 1957 catch dropped to 4¾ billion pounds—down a half billion pounds from 1956. Prices were better, averaging 7.39 cents a pound at boatside, compared with 7.03 cents for the 1956 catch. The fishermen received $351 million for the 1957 catch as compared to $369 million for 1956. The processor received $592 million compared with $622 million in 1956; the wholesaler $836 million compared with $879 million.

The 1957 catch consisted of 2¼ billion pounds of industrial fish (fish meal, etc.), and 2½ billion pounds of food fish. Largest decrease was in the catch of industrial fish (menhaden). Tuna led the food fishes in pounds harvested—295 million; salmon was second with 257 million pounds; shrimp third with 204 million pounds, and Maine herring fourth with 153 million pounds.

Per capita consumption remained at a respectable 10.2 pounds. Clearly, fish is an important item on the American table.

Record breaker

The popularity of sport fishing and hunting in the United States soared to new heights during fiscal year 1957, when a record total of 34,195,183 licenses was sold, according to figures compiled by the U.S. Fish and Wildlife Service.

This represents an increase of more than a million licenses over the previous high total attained in fiscal year 1956 when 33,163,831 paid license holders were recorded. The 1957 total was divided between 19,276,767 for fishing and 14,918,416 for hunting. Fishing licenses accounted for the largest proportion of the increase—574,784 against 456,568 for hunting licenses.

Total cost to hunters and anglers for all licenses, permits, tags, and stamps (not including the Federal duck stamp) was $90,617,039—an increase of $829,145, over the previous year's total of $89,787,894. Hunting licenses amounted to $47,847,456 of the 1957 total while fishing licenses revenue totaled $42,769,583.

Of the "big ten" states for 1956-57, New York stood seventh as a "fishing state" with 828,636 fishing licenses; and second in the hunting tally with 1,024,975 hunting licenses.

An acre

An acre of good farm land contains two to three tons of micro-organisms and worms. This is 8 to 15 times the weight of domestic animals which it could support for a year. And the microbes "eat at first table"—their needs must be met before the cows'.

Our Forest Preserve

(*Continued from page 9*)

What does wilderness preservation mean? It simply means preservation against commercial exploitation and private control. The beauty and the natural wonders of the Forest Preserve will not be endangered by reasonable public use, or even by some dead trees. There is an old saying that all trees are wood, but pine is not mahogany. To me all trees in the Forest Preserve are mahogany. Undisturbed natural beauty is more than ample justification for the protection of its forests. I regard its growing trees—its monarchs, its scrubs, its second growth, its fallen trees as exhibits, as museum pieces, valuable in their natural state because they are all a part of a natural association. However, the problem is not without difficulty. It will require clear heads and firm hands to keep this great Forest Preserve as it was meant to be.

Now what about improving our roads and highways in the Forest Preserve? I am in favor of that. The people are in favor of that as shown by their vote on the highway amendment last Fall. I favor the Adirondack route for the Northway. I hope it proves feasible to make the deviation to the west side of Schroon Lake. But only those highways are justified which are required in order for the public to get into the Forest Preserve region with a reasonable degree of dispatch and safety. This does not mean a network of new roads into the wilderness areas. In Yellowstone National Park, for example, one of the finest, and most heavily used of all the national parks, there have been no new highways into new areas in the past 50 years. Instead, old highways have been improved to handle modern day traffic. As a matter of fact, the National Park Service is pulling back on new road construction because that Service has found that too many roads or roads in the wrong places impair the National Parks. The Northway, however, will be a road in the right place and will serve the public well. Good taste and good judgment, are important in the improvement of highways and in the placement of foot trails in the Forest Preserve, so that anyone who seeks wilderness can find it. It is no problem for those who follow the trails to find solitude, beauty and adventure. But we also want those citizens who never get away from a highway to experience the quality of wilderness. For some the wilderness lies but five minutes walk from a road; for others it may be five hours. For thousands of others it may come from the Summit House at Whiteface, from a golf course at the Lake Placid Club, from the porch of Mirror Lake or Whiteface Inn, from the top of the chair lift at Belleayre Mountain, from the dock at the Higby Club, from an island in Lake George, from a boat on one of the thousands of lakes and ponds and waterways in the Forest Preserve or from just a tent platform somewhere back in the woods. Then there are the other millions of people who see and sense and feel the wilderness only from the roadside, without ever once getting out of their cars. But the wilderness is there and, consciously or unconsciously, people everywhere, in all places, under different circumstances, respond to it. Let's not destroy it. Let's not cut it down. Let's not lumber off even a part of it.

Leisure time is expanding much more rapidly than the Nation realizes. We in the Conservation Department believe that leisure time should be put to worthwhile use. We must deal with this growing need for recreation in our wilderness areas. There is no time to lose if the people of this State are to retain their mountains, their forests, their rivers and lakes and streams, for outdoor enjoyment. The good use of leisure—use that will strengthen the moral fibre of America—is one of our responsibilities. To provide leadership in this direction, is one of our objectives.

Soon we hope to have in action a program broad enough to overtake today's problems; broad enough to prepare for future problems before they develop. We will call this PROJECT FOREST PRESERVE. I hope it will emphasize a firm determination to maintain, without compromise, Article 14 Section 1 of the Constitution. Lumbering does not fit into this picture. Those of us in the Conservation Department are vitally worried, and I think with good cause. We see the lumbering pressure which is here. We are conservation-minded public officials with responsibilities we do not treat lightly. It is our duty to do something before the horse is out of the barn. But we wish to make it clear that we do not regard our position to be in conflict with forestry for forest products. On the contrary, we are dependent upon our commercial forests to protect our wilderness forests. If ever we come to the borders of the Adirondack and Catskill preserve with a need for timber which cannot be met elsewhere, then our wilderness areas are in trouble. It is to the foresters of New York State and their effective programs for sustained yield cutting on the production forests to whom we also look for help in wilderness preservation. We in the Conservation Department recognize this—and we face our PROJECT FOREST PRESERVE in a spirit of co-operation, and with a feeling that on sober second thought, the foresters and the forest industries will support us and cooperate with us in our determination to preserve our wilderness forests in the Adirondacks and Catskills.

Recreation and greater use and greater enjoyment of the Forest Preserve fit into this program in a very substantial degree. Stream and pond improvement, more public access sites to our lakes and streams, more foot trails and horse trails for better access to the remote areas, more campsites, more bathing and picnicking areas, more roadside clearings to afford better views of beautiful panoramas for the enjoyment and the pleasure of the travelling public are all part of this program.

How else should we plan for the Forest Preserve? I think the process requires this final and concluding thought: We must always evaluate the Forest Preserve in terms of human benefits—human rights—as opposed to financial benefits and property rights.

It will probably take longer than our lifetime to complete the job but this is the direction in which we should move. The pattern is set. The way is clear to save and to use the most precious area we have in the State for a purpose for which it was intended to be used—refreshment of the body—refreshment of the mind—refreshment of the soul. These are human benefits, and I place them above — high above — financial benefits or financial gain.

People have a warm feeling for the word "wilderness." It reflects adventurous times and personal experiences. It reminds Americans that it is a part of American tradition. Americans think of wilderness as something which is close to all that is good and strong in their country's history.

May the interest of the people in this great, this wonderful Forest Preserve, continue to grow in the years ahead and may it continue to provide forever an inspiration and an outlet for the mind and the soul to those who venture into the woods—far beyond the end of a road.

Museum in the Sky

(*Continued from page 13*)

and its War Memorial highway to the top can be something more than a place where you can drive to see a wonderful panoramic view of the North Country; something more than an exhilarating Winter ski resort area containing the Marble Mountain Ski Development and the Whiteface Ski Center; something more than a place where you can get an exciting aerial ride to the top of Little Whiteface over the tree tops in a double chair lift. It is hoped that this War Memorial can become a year 'round visiting spot for educational as well as recreational purposes, where Man can play and relax and learn something of the mysteries of Nature and commune with the weather gods.

The wily black

In checking our waterfowl banding data in New York for last year, we find the record of an elusive black duck. It was banded by Dr. W. B. Large on November 9, 1939 at Rochester, and ultimately brought to bag on the Paquosan River near Hampton, Virginia in November, 1957. For 18 years it had eluded the gunners.

No sale

A forester in the Conservation Department's District 3 had a rather disconcerting experience. A Forest Practice Act co-operator was signed up after owning the property only a short time. When the Forester inspected the woodlot he agreed with the owner that a timber sale should be made. The owner went with the Forester while he marked the merchantable timber, only to discover after 15 acres had been marked that they had been working on a neighbor's property.

Ragweed and hay fever

Each year, come July and August, the hay fever sufferers dream of a vacation at the seashore or in the mountains to escape the pollens that cause them discomfort.

The State Health Department has adopted a comprehensive program which will operate air sampling stations in the affected areas of the State and attempt to blueprint a State-wide campaign against this preventable disease.

Ragweed seems to be the principal source (95 per cent) of the irritating pollens and it is common along every roadside, garden patch and in cultivated fields. Its control will necessitate the cooperative efforts of many.

The ragweed is a source of food for many forms of wildlife but certainly its control to the extent of decreasing the debilitating effects of "hay fever" should not affect the wildlife picture.

Net loss

A Canadian Conservation Officer seized a minnow net because the operator did not have the license required. The case was settled out of court.

The officer was surprised and amazed a few weeks later when he was asked by the net operator's wife: "When is the Department going to release my dining room curtains?"

White water derby

New York State has a new and exciting outdoor event.

The first annual White Water Derby was considered a real success; in fact, such a success that already plans are in the making for a bigger and better one next year.

An estimated crowd of 3,000 people gathered along the upper Hudson River from North Creek to Riparius to watch 25 boats—representing 44 entries—cover the eight-mile course of Hudson River white water rapids.

Participants were from eight states and Canada, and all were impressed with the challenging qualities of this stretch.

The Johnsburg Fish and Game Club of North Creek was the prime mover and it looks as though the club has really started something. We're betting there will be more participants and an even bigger gallery next year.

Suicide

Freak accidents occur more frequently in nature than one would guess. Usually, 'though, they go unnoticed because the evidence quickly disappears. Here's one, however, that the camera caught—a kingfisher's suicide. This bird came to grief at the Department's Game Farm at Delmar; probably took off from a fishing expedition at one of the duck ponds and quite obviously missed clearing the fence by a half inch or so.

A modern allegory

Once upon a time, there was a deer family (d-e-e-r, that is) who lived on the edge of a forest. This family consisted of a mother deer (or the doe) and two little spotted fawns. The father? Well, to be perfectly frank, father deer are not the best of husbands. When the honeymoon is over, they just sort of up and leave. But that's the way the ball bounces, and our doe never gave it a second thought. She had enough to think about anyway, what with looking after the twins, seeing they had enough to eat—tender twigs, and things like that—and licking them every day. You see, the bath tub wasn't working.

But one day, just to show you she was a real sport, the mother deer said, "Come on, kids, let's take a walk in the woods and see what's cookin'." So they did. They walked and walked, until they came to a picnic area for people, with benches and tables and fireplaces all around. The fawns were pretty excited, because they had never seen anything like this before. Then, one of them nudged his mother and whispered, "What's that thing over there?" It was a little girl with yellow pigtails, all by herself, just sitting there and waiting. "Why, that's a people," the mother deer explained. "As you can see, they have only two legs—and they rarely, if ever—grow antlers. I'm told they don't eat wood, either."

The fawns were quite impressed, and they moved up closer to get a better look at the little girl. Finally, one of them said, "Ma, why don't we bring that people home with us and raise it as a pet? I don't see its mother around, so it must be deserted." But the mother deer shook her head. "No," she said. "I'm sure the mother will be back. And how do you think she'd feel if her baby were gone, when she returned? Besides, I understand that people don't make very good pets at all. When they get big, they're likely to turn mean." So the fawns decided that mother knew best, and they went home without the little girl. And sure enough, the little girl's mother did come back.—ROSEMARY CLARKE, *N.Y.S. Radio Bureau*

Red or yellow?

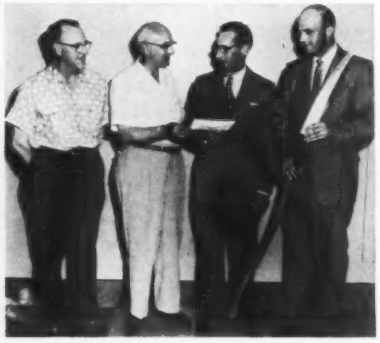
In overall rating, yellow again proves to be the most quickly and most accurately recognized color.

In safety field color tests sponsored by the National Rifle Association, the California Optometric Association and the California Department of Fish and Game, yellow showed up six times better than red.

The Meylan saw

Above—Forester Gustave T. Meylan, left, demonstrates the advantages of his pruning saw over the conventional variety handled by District Forester Kennedy

Below — C. D. Kingsbury, Supt. State Forests, second from left, congratulates "Gus" Meylan on his award from the State Board



There's no good reason why a saw should not be mounted on an ax handle, but nobody had thought of it nor realized its advantages as a pruning tool until Gustave T. Meylan tried it out.

But "Gus" did think of it and experimented with it in forest plantations in the Conservation Department's Forest District #3 out Cortland way. The Meylan saw was found to be so much easier and more effective to use than the conventional pruning saw that it has been widely adopted.

Most recently, the State Merit Award Board recognized Meylan's contribution —a little easier way to do a hard job— and presented him with its award of merit accompanied by a cash grant of $250.

Meanwhile, back in Cortland County they were celebrating the sesquicentennial of the Legislature's 1808 action in separating Cortland and Onondaga counties. As a part of the celebration, the Mayor of the City of Cortland had decreed, in honor of this historical event, that all males in the county were to grow a beard, with the exception of any who wanted to pay $3 for a shaving permit. That's why, in the picture below, District Forester Kennedy and Gus Meylan of Cortland are sporting such distinguished beards.

P.-R. and D.-J.

Federal aid funds made available to the states and territories for sport fish and wildlife restoration increased again in 1957 to a new high of slightly over $21 million. Monies, unobligated in previous years, raised this figure to $27.5 million. Receipts from excise taxes on sporting arms and ammunition and on fishing tackle for 1957 totalled just under $20 million, a slight increase from the previous year.

Sport Fish Restoration.—Funds apportioned the states under the D.-J. (Dingell-Johnson) program decreased approximately $100,000 from 1956, reflecting the 3.7 per cent decrease in excise tax collections for 1956; territorial allotments were $120,000, as in the past. Despite this, and owing to carry-over of unobligated funds from the previous year, total net obligations increased 20 per cent to a new high of $5,434,700. The number of trained personnel employed, 292, was practically the same as in 1956, but the average salary increased from $4,604 in 1956 to $4,943 in 1957.

Wildlife Restoration.—The 1957 funds apportioned to the states and territories, under the P.-R. (Pittman-Robinson) program, including one-fifth of the backlog of unappropriated tax collections, totalled $16,380,000; an increase of almost $2 million over the 1956 apportionment. This increase is reflected in larger net obligations for all activities.

One of the program highlights was *access*. No amount of management and research can be worthwhile unless the hunter and fisherman can benefit through public hunting and fishing opportunity.

Back in 1900 the problem was minor. There were only 25 persons for every square mile in the United States. By 1970 it is expected there will be 69 persons for every square mile. Demands on the Nation's land and water resources by this population growth have been further multiplied by the continual rise in standard of living.

Conflicts in demands for living space are only natural. It is certain they will become more serious and more numerous. The future of public hunting and fishing will depend on the steps taken now to insure a fair share of land and water areas for fishing and hunting.

Financial resources play a large role, for land control is expensive. Unfortunately, access in areas of greatest need, near large centers of population is the most costly. It has become a race to keep up with sportsmen's needs and ahead of increasing land values.

When access areas are acquired, they usually require development to realize their potential. Roads, trails and parking areas are usually required to provide fishing and hunting opportunity in previously inaccessible areas. Docks, boat launching ramps and channels, bridges, wells, sanitary facilities, fences—to name a few—are required to provide safety and convenience to the sportsman. More and more, whole families utilize the areas, and it is necessary to provide fireplaces, swimming beaches, picnic tables and other facilities to insure utilization of an area's full potential.

Federal aid to fish and wildlife has been of tremendous help to the states in providing funds for such programs.

Ah, Egypt!

Scientists examining ancient Egyptian drawings and bas-reliefs, estimated to be 4,000 to 5,000 years old, have discovered the methods used by the Egyptians to net and hook fish; the way they split and dried them, and how they probably propagated them in especially designed and constructed ponds.

One interesting scene, carved on a tomb, shows an Egyptian of obvious importance sitting in his garden, his wife just behind him and his servants picking fruit from the trees. The master is fishing with two lines and two hooks and his wife stands ready to unhook the fish as they are caught. (Ed. note.—It's difficult to see how we have lost so much ground in 5,000 years.)

No put-put

'Tis said that outboards of the future will be so silent only the sound of the bow wave will be heard.

Recent laboratory accomplishments by the Outboard Marine Corporation indicate that tomorrow's outboards will be this quiet, even at speeds up to 40 miles per hour.

At the Corporation's research center, engineers—over a period of 37 years—have succeeded in quieting down the clamor of outboards from the whining kickers of yesterday to the comparatively silent models of 1958.

Cayuga record

Biggest salmon yet to be taken in Cayuga Lake, as a consequence of recent stocking of this species there by the Conservation Department, is this beautiful specimen pictured above.

The vital statistics are as follows:

Angler:	Fred Brown, Ithaca.
Taken:	April 20, 1958.
Area:	Taughannock Point.
Lure:	Little Cleo (spinning lure).
Total length:	30.9".
Weight:	9.6 lbs.
Age:	5+ (one of the first planting of fingerlings made in Fall of 1953, from Atlantic salmon parents).
Stomach analysis:	15 smelt, 2 sawbellies.

1891 — 1958

1891—The Edward Ackermans were married and settled on a farm just south of Delmar.

1920—Mrs. Ackerman lost her heavy gold wedding ring while tending the chickens on the farm. Although she and her family searched diligently for the ring they could not find it.

1932—Mr. and Mrs. Ackerman sold their farm to the State of New York as the site for the Conservation Department's Delmar Game Farm.

1958—Lewellyn Baker, Assistant Foreman, Delmar Game Farm, was plowing a field (the same one he has plowed and fitted since the mid-thirties) when he noticed a yellow flash in the turning furrow. He stopped to investigate and found—you guessed it—Mrs. Ackerman's long-lost wedding ring; initials E. A. to C. R. 1891 still discernible. Mrs. Ackerman, now 87 years of age and a resident of nearby Clarksville, is once again wearing her ring and recalling its loss and the search for it nearly 40 years ago.

Red squirrels

The home range of the red squirrel is seldom more than 500 to 700 feet across. Only the mating season or a scarcity of food takes him outside.

The bobolink

Most of our songbirds nest and find their food in woodlands, along woodland borders or in old orchards. Some, like the robins, house wrens, martins and bluebirds, usually prefer to live near human habitations—even in villages and cities. Others, notably the redwing blackbird, are found only around marshes and swampy places. But there is a small group of songbirds which are seen and heard only in open country: Prairies, meadows, hayfields and abandoned farm lands. In addition to some native sparrows, the horned lark, the killdeer and the familiar meadow larks, this group includes that happy-go-lucky "harlequin of the meadows," the bobolink.

In Spring the male bobolink cannot be mistaken for any other bird. Like the meadow lark and the orioles, he is a member of the blackbird family. His underparts are black. The back of his head and neck, however, are buff colored and there are conspicuous white patches on his shoulders and rump, so that he seems to be wearing "a full dress suit put on backwards." One of his common names is skunk blackbird.

The bobolink's courtship song is an indescribable bubbling melody that tumbles out faster and faster, pitched higher and higher, with short variable notes among which "bobolink" can be distinctly heard. It is often given during flight; also when perched on a bush or clinging to the top of a tall weed, but never too close to his mate's nest. That harum-scarum rollicking music baffles the interpreters and imitators of bird calls although Henry Thoreau caught the spirit of it when he wrote: "This flashing, tinkling meteor bursts through the expectant meadow air, leaving a train of tinkling notes behind."

The female bobolink, a demure olive-green bird with buffy underparts and stripes on her back and head, looks like a large sparrow. Her nest is built on the ground in a heavy stand of tall grass, weeds, clover or similar vegetation, and wonderfully concealed although not roofed over like that of a meadow lark. The parents never fly directly to it or from it. They walk. From 4 to 7 blueish-gray or reddish-brown eggs are camouflaged by being heavily spotted.

Until the young are ready to fly, a family of bobolinks consumes vast numbers of cutworms, grasshoppers, weevils and other injurious insects. Later, weed and grass seeds, or grain, are added to their diet. By that time the male looks much like that of the female and their young. His call, if any, is merely a metallic "pink."

During the Summer, bobolinks gather first in small flocks, then in Winter homes which may be as far south of the equator as Paraguay or Argentina. Some of those flocks may consist of 2,000 or more birds and, like robins, meadow larks, orioles and blackbirds, they migrate mostly in daytime rather than at night as do most songbirds.

There was a time when hundreds of thousands of bobolinks, called "rice birds," were slaughtered annually and sold in markets because of the damage they did in the rice fields so extensive then in our southern states. Since the passage of the Federal Migratory Bird Law in 1913 they have been protected.—*Nature Bulletin*, Forest Preserve District, Cook County, Ill.

From the U.N.

More than 100 species of wild creatures have died out in the past 150 years. This has become a matter of deep concern to the U.N. Educational, Scientific and Cultural Organization. Even worse, according to an Associated Press release from the United Nations, 600 species more may face extinction in the years ahead.

Man's activities are chiefly responsible, the U.N. believes. They see it as a clear case of "cutting off the nose to spite the face", forgetting that the natural life that surrounds us is what makes human living worthwhile—indeed, possible.

Moving timber

John Sharpe of Skaneateles signed up as a co-operator under the Conservation Department's Forest Practice Act and asked to have a woodlot marked and estimated. Forester Bock of District 3 (Cortland) marked the woodlot on a Tuesday, sent the volume computations along with a list of profitable buyers to the owner on Wednesday. Mr. Sharpe received the information on Thursday and sold the woodlot to the Young Lumber Co. of Cortland on Saturday.

Painted Christmas trees

Tree plantation owners around Lowville received a break this past season. A local purchasing agent contracted for some 32,000 Christmas trees. By paying a lower stumpage price, many of the grade 2 trees were cut that ordinarily are unsaleable. Such trees are poor in shape or color.

In this case the operator artificially colored a number of the off-color trees and found a ready market for them. Possibilities for development and improvement in this field seem good. It may be possible, as a consequence to move large quantities of presently unsaleable trees.

Conservation Library

Part 9

Part 1 of the Conservation Library appeared in the February-March, 1956 issue and dealt with the identification of animals. Part 2 in the April-May, 1956 issue listed books on trees and shrubs. Part 3 in the June-July, 1956 issue listed books on herbs (wild flowers) and grasses. Part 4 in the August-September, 1956 issue listed books on fungi and aquatic plants. Part 5 in the December-January, 1956-1957 issue listed books on lichens, ferns, and mosses. Part 6 in the February-March, 1957 issue listed books on soils, rocks, and minerals. Part 7 in the December-January, 1957-1958 issue listed books on oceanography. Part 8 in the June-July, 1958 issue listed books on fossils.

This installment will list books on general conservation, ecology and management and conclude this series.

Reading guide: *Books are listed in the left-hand column and recommending authorities across the top. Stars indicate which specific books these authorities recommend. Accompanying digests show source and briefly outline contents of each book listed.*

Books on General Conservation, Ecology and Management

A Sand County Almanac (1949) by Aldo Leopold; Oxford University Press, New York. A small book compiled from the best of Aldo Leopold's writings. A classic in conservation philosophy that is easy, interesting, and informative reading. Illustrated with good pencil drawings.

Natural Principles of Land Use (1944) by Edward H. Graham; Oxford University Press, New York. Small book discussing basic principles of conservation. Easy reading. Good black and white photos. Good annotated bibliography and indices.

Our Wildlife Legacy (1954) by Durward L. Allen; Funk and Wagnalls Co., New York. Good, popular, easy to read, general conservation book. A few black and white photos. Good index and bibliography.

Conserving Natural Resources (1955) by Shirley W. Allen; McGraw-Hill Co., New York. Semi-technical but good reading for conservationists. Many illustrations including photographs and maps. Each chapter with bibliography.

Biological Conservation (1954) by John D. Black; Blakiston Co., New York. Beginning college text dealing with conservation generally, but with the emphasis on wildlife. Maps and figures. Annotated bibliography and list of conservation films.

Conservation in the United States (1949) by Gustafson, et al; Comstock Publishing Co., Ithaca, New York. Textbook. A good thorough study of conservation of our natural resources. Many photographs and other figures. Selected bibliography.

American Resources (1951) by J. R. Whitaker and Edward A. Ackerman. Harcourt, Brace and Co., New York. Geographer's approach to general conservation. Maps and drawings. Author-subject indices.

Conservation of Natural Resources (1950) edited by Guy-Harold Smith; John Wiley & Sons, New York. Comprehensive discussion of facts concerning our natural resources. Many authors. Photographs and maps. List of references with each chapter and short list at end of book.

Pheasants Afield (1953) by Durward L. Allen; Stackpole Co., Harrisburg, Pennsylvania. A brief, but well done book on all aspects of pheasant management. Good reading for sportsmen and conservation students. Numerous illustrations.

Elements of Ecology (1954) by George L. Clarke; Wiley, New York. General text on ecology. One section deals with marine organisms and their environments.

The Ocean (1949) by Francis D. Ommanney; Oxford University Press, London. Popularly written book on temperate zone marine ecology. Black and white line drawings, maps and bibliography.

Animal Ecology (1950) by Charles S. Elton; Methuen & Co. Ltd., London. Easily understood discussion of ecology. Bibliography.

Fundamentals of Ecology (1953) by Eugene P. Odum; Saunders, Philadelphia. College text on principle of plant and animal ecology including ecological approach to public health and human society. Many figures, bibliography, index.

Principles of Animal Ecology (1949) by Warder C. Allee, et al; Saunders Co., Philadelphia. College text. Comprehensive but somewhat technical. Black and white illustrations, maps, good bibliography.

The Distribution and Abundance of Animals (1954) by Herbert G. Andrewartha and L. C. Birch; Univ. of Chicago Press, Chicago, Ill. Technical discussion of

	Edminster*	Lemon*	Webb*	Ayers*	Needham*	Swanson*	Heiberg*
A SAND COUNTY ALMANAC *Aldo Leopold*	☆	☆					
NATURAL PRINCIPLES OF LAND USE *Edward Graham*	☆	☆	☆				
OUR WILDLIFE LEGACY *Durwood Allen*	☆	☆				☆	
CONSERVING NATURAL RESOURCES *Shirley W. Allen*		☆					
CONSERVATION IN THE UNITED STATES *Gustafson, et al.*		☆					
BIOLOGICAL CONSERVATION *John D. Black*		☆					
AMERICAN RESOURCES *Whitaker, J. R., Ed. A. Ackeman*	☆	☆					
CONSERVATION OF NATURAL RESOURCES *Gay - Harold Smith*	☆	☆					
PHEASANTS AFIELD *D. Allen*						☆	
ELEMENTS OF ECOLOGY *Clarke*				☆			
THE OCEAN *Ommanney*				☆			
ANIMAL ECOLOGY *Elton*					☆		
FUNDAMENTALS OF ECOLOGY *Odum*	☆		☆		☆		
PRINCIPLES OF ANIMAL ECOLOGY *Allee*					☆		
THE DISTRIBUTION AND ABUNDANCE OF ANIMALS *Andrewartha & Birch*					☆		
AMERICAN WILDLIFE AND PLANTS *Martin, Zim, Nelson*	☆					☆	
AMERICAN GAME BIRDS OF FIELD AND FOREST *Frank Edminster*	☆					☆	
HUNTING WHITETAILS *Frank Edminster*						☆	
THE LAND AND WILDLIFE *E. H. Graham*	☆		☆			☆	
CANVASBACK ON A PRAIRIE MARSH *H. A. Hochbaum*						☆	
HIGH TIDE AND AN EAST WIND *Bruce Wright*						☆	
PRAIRIE DUCKS *Lyle K. Sowls*						☆	
GAME MANAGEMENT *A. Leopold*	☆		☆				
DEVELOPING FARM WOODLANDS *J. F. Preston*	☆						☆
THE MANAGEMENT OF FARM WOODLANDS *C. H. Guise*							☆
MANAGING SMALL WOODLANDS *A. Koroleff*							
WILDFOWL FOOD PLANTS *W. L. McAtee*						☆	

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ecology based on animal distribution. Bibliography, illustrations, maps.

American Wildlife and Plants (1951) by A. C. Martin, Herbert Zim and Arnold L. Nelson; McGraw-Hill, New York. Primarily a reference work. Summarizes 50 years of food habit studies of birds and mammals. Summaries given of (a) each important species or group of bird and mammal with information on distribution and food habits, (b) each species or genus of plant which is important as food for wildlife and which groups of wildlife. Maps, diagrams and drawings.

American Game Birds of Field and Forest (1954) by Frank C. Edminster; Scribners, New York. Comprehensive treatment of American game birds including classification, habits, range, management and hunting. Many photographs, maps and graphs.

Hunting Whitetails (1954) by Frank C. Edminster; Wm. Morrow and Co., New York. Discussion of whitetail deer, their management, and hunting. Illustrated.

The Land and Wildlife (1947) by E. H. Graham; Oxford University Press, New York. A fine, literate, treatment of the philosophy, principles and practices of wildlife management from an ecological approach.

The Canvasback on a Prairie Marsh (1944) by H. A. Hockbaum; American Wildlife Institute, Washington, D.C. Out of print, but available in many libraries. Very good book on waterfowl management with emphasis on the canvasback duck. Black and white photographs and line drawings and some paintings, one in color.

High Tide and an East Wind (1954) by Bruce S. Wright; Stackpole Co., Harrisburg, Pennsylvania. A small book dealing with the black duck and its management. Illustrated.

Prairie Ducks (1955) by Lyle K. Sowls; Stackpole Co., Harrisburg, Pennsylvania. A study of prairie duck species, their behavior, ecology, and management. Illustrated.

Game Management (1933) by Aldo Leopold; Scribners, New York. Still one of the best statements of the principles of wildlife management although some details are now out of date. Basic work. Line drawings, charts, tables, bibliography and index.

Developing Farm Woodlands (1954) by John F. Preston; McGraw-Hill, New York. Good book for student and layman on small woodlot management. Helps woodlot owner to manage woodland as a profitable crop. Tables, figures and other illustrations.

The Management of Farm Woodlands (1939) by Cedric H. Guise; McGraw-Hill, New York. Designed to help farm woodland owners to better manage their forest crops. Tables, figures and other illustrations.

Managing Small Woodlands (1947) by A. Koroleff; American Forestry Association, Washington, D.C. Booklet to help land-owner better manage small forest properties. Includes topics like cutting, estimating timber, marketing, thinning, and others. Simple line drawings.

Wildfowl Food Plants, Their Value, Propagation and Management (1939) by W. L. McAtee; Collegiate Press, Ames, Iowa. Title describes contents.

Winter field trips

In Winter, our woodlands give an altogether different impression from other seasons. Their mood is one of quiet waiting and sleep.

Now is the time to plan a school trip into the out of doors to see how wild living things spend the cold months. Whether it is only a hike to some nearby park, meadow or vacant lot for an hour, or whether you spend the day in some forest or woodlot, a little planning and preparation will make your trip a success regardless of the weather. Be sure to wear warm clothing and shoes or galoshes that will keep your feet dry and comfortable. Take along a few wide-mouthed jars, baskets, plastic bags and cardboard boxes in which to carry collections back to school for later study. The secret of Winter comfort in the open is to keep moving.

In Winter, abandoned birds' nests are easy to find in leafless trees, shrubs, vines and weed patches. They should be carefully removed, sometimes with the twig or weed supporting them, and carried back to school in a box or basket. There they can be sprayed with liquid plastic so they can be handled without shattering. The nests of each kind of bird can be recognized from the nest materials and style of building.

A few of the most commonly seen native birds that spend the Winter in New York are the crow, blue jay, cardinal, junco, titmouse, nuthatch, chickadee and the downy, hairy and red-bellied woodpeckers. Keep a list of the kinds and approximate numbers of these, and many others, seen on your trip. In suburban areas and the less crowded parts of cities, some or all of these birds can often be attracted to homes or school grounds by Winter feeding stations. Suet, drippings, peanut butter, sunflower seeds, cracked corn and nuts are best.

Bring back a collection of wild seeds, burrs and berries, try to learn which kinds are eaten by birds and which are not. Plant a few kinds in pots to see what comes up.

A rotten log offers food and shelter to an abundance of life, both plant and animals, for years and years before finally returning to the forest soil. Each year some tenants move out and others move in: Beetles, ants, flies, bees, spiders, sowbugs, centipedes, millipedes, slugs, snails, earthworms, salamanders, mice, shrews, molds, mushrooms, fungi—and often several kinds of each. Find a rotten stump or log and tear it apart, piece by piece, to see how many kinds of these you can recognize. Take a chunk of this rotten wood back to school to see what crawls out when it warms up.

Mosses and lichens thrive during the cold months while other plants are dormant. A moss garden can be made by covering the bottom of a shallow dish or pie tin with pieces of the different sorts, then keeping it moist. A simple way to start a sealed terrarium is merely to put a quart of rich damp soil in a clean wide-mouthed gallon jar, screw the lid on tight and set it near a window. That's all. Soon, dormant seeds already in the soil will sprout and grow into a miniature enclosed world with its own weather and cycle of life.

Half fill another such gallon jar with pond water and drop into it a handful of sunken leaves, twigs or water weeds, from the pond. Let it stand uncovered. Within a few days it will teem with tiny crawling, swimming, skipping animals. Watch them with a reading glass or hand lens.

Renegade

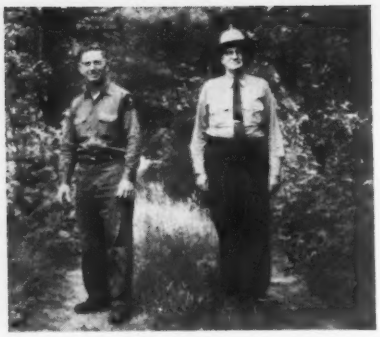
Complaints about gray squirrels are not uncommon in and around the "Big City," but when a bear attacks cattle within 40 miles of New York City, everybody moves.

On May 13 a report came in to the New York District Law Enforcement office that a bear was attacking cattle on the Ernest Eggert farm at Lake Carmel. On investigation, Protector Bubenicek did catch a glimpse of a black bear in a swamp in the vicinity, but made no further contact.

Then on May 15 came a call that a bear was menacing people at Clear Pool Camp, Madison Square Boys' Club at Kent Cliffs, not too far from Lake Carmel. The superintendent of the camp was quite concerned because a group of boys for the camp was expected the next day.

Further investigation showed that not only was the bear there but in bad humor; even dangerous. So, reluctantly, the Protector shot the bear.

The animal weighed in at 200 pounds and was a male in excellent condition. It was believed to be an animal that escaped from the Birch Hill Game Park at Patterson (N.Y.) over a year ago and was never captured.



Clifford Hebdon, State Blister Rust Control Foreman, and John Charlton (right) of U. S. Forest Service

All in the day's work

From *The Watertown Times*, May 7, 1958:

LOWVILLE, May 7 — Mrs. Wanda Wetmore, 32, Glenfield, Route 1, and her three little daughters, Patricia, 2, Jane, 4, and Kathy Lynn, 11 months, escaped possible drowning when their automobile went over a 15-foot embankment and landed on its top on a rock in Otter Creek Tuesday afternoon on the Otter Creek-Greig road.

Below the rock where the car landed the water was from eight to nine feet deep. Mrs. Wetmore and her children were rescued by John Charlton of the U. S. Forest Service and Clifford Hebdon of the New York Conservation Department.

From the report of Fred U. Sievers, Federal blister rust supervisor, Albany:

"Charlton and Hebdon (State Blister Rust Control Foreman who works under Charlton's direction) were returning from a routine field inspection when a small girl was seen in the road waving her arms and pointing in the direction of the river. Hebdon, realizing that something serious had happened, leaped from the moving car. Seeing a woman holding three infant children in her arms while trying to hold on to an overturned car in the middle of the swollen river, Hebdon went over the 15-foot stone embankment in considerably less than nothing flat.

"The car was resting upside down on some large boulders in the middle of the river. Between two and three feet of the car was submerged in the rushing water with deeper water all around. With utter disregard for his own safety, Hebdon, who stands five feet, six inches tall and weighs 145 pounds, made his way through the water to the car and carried the three injured children, one by one, to the embankment where they were lifted to the road by Charlton. After the children had been carried to safety, the mother was guided to shore on ladders furnished by a passing electrical supply truck, and with the assistance of a local resident, Earl Hiena.

"First aid was given by a State Trooper who was summoned to the scene prior to the arrival of an ambulance. It is my personal belief that if it had not been for the quick action of Hebdon, some, or perhaps all of the children would have died by drowning as, when our men arrived at the scene, the mother was completely exhausted and would not have been able to hang on much longer."

Statement by Conservation Commissioner Sharon J. Mauhs:

"I frequently have cause to be proud of the employees of the Conservation Department, but never more so than on occasions like the one described here, when they are instrumental in saving human lives. The quick thinking, bold action and resourcefulness exhibited by Jack Charlton and Clifford Hebdon in a sudden, critical emergency is convincing testimony as to the kind of men we have on our field force, and illustrates in striking fashion that in conservation work the opportunity for conserving human life, as well as natural resources, is always close at hand, no matter how routine the day's work may seem to be. My highest commendation and personal appreciation is extended to both of these men."

Report from D. U.

For the third successive year Ducks Unlimited has allocated a half million dollars or more for the continuation of migratory waterfowl breeding grounds restoration, this time appropriating $525,000 to D.U. (Canada) for its operations during 1958. The appropriation was made at the 21st annual Ducks Unlimited board of trustees meeting on April 25th and 26th.

With this appropriation of $525,000, the total amount sent to Canada since 1938 soared to almost $6,000,000 which duck-hunter-sportsmen have contributed to Ducks Unlimited for the work of building or restoring more than 450 "duck factories" on the prairie breeding grounds in the Provinces of Manitoba, Saskatchewan and Alberta. In this area approximately 65 per cent of this Continent's migratory waterfowl are produced each year.

During the 20 years of field work in Canada, 513 projects have been completed; 54 of these being retired or consolidated with adjoining projects. At the present time D.U. has 459 active "duck factories" in operation with a shoreline in excess of 4,000 miles. During the 1957 construction year, D.U. (Canada) built 35 new projects and three extensions to present waterfowl areas.

The need continues for additional breeding grounds for our ducks and geese in the Canadian prairie provinces. Expanded agriculture in that area is reducing natural breeding areas for waterfowl.

Tribute is due the Dominion and provincial government agencies in Canada, as well as its farmer-conservationists for the generous support they have given to Ducks Unlimited's efforts.

New idea

A long fight has been waged to decrease water chestnut, an introduced aquatic plant that has proven detrimental to fishing, waterfowl, boating, swimming and other recreation. An eradication project, financed under the D-J program (Federal Aid in Fish Restoration) is helping to remove this threat to State waters. First priority is being given to northern and western extensions of water chestnut, especially Lake Champlain and the Finger Lakes area so as to eradicate the plant before it occupies large areas such as it does in the lower part of Mohawk and Hudson rivers.

The most recent development in this battle is in the improvement of spraying technique. A new 18-foot aluminum boom, mounted on a boat driven by airplane-type propellor, is more than doubling the speed and economy of spraying with 2,4-D in kerosene emulsion, an effective killer of this weed. The air "prop" drive permits navigation in shallow, weedy waters where a conventional outboard motor would be useless.

Up to the present time the several thousand acres of water chestnut along the Mohawk and Hudson rivers have presented a most difficult problem because of the expense that would be involved in complete eradication. Improvements in methods for combatting this pest have brightened the outlook for eventual victory.

The spray boom here shown is similar to tractor-mounted booms but is of aluminum. Mounting it on a boat involved some special problems, solved with the help of Leo King of the Capital District Game Management area.—JOHN R. GREELEY, *Chief Aquatic Biologist*

Gnats and midges

Any small fly is commonly called a gnat or a midge, but flies of whatever kind are seldom popular, either large or small. True flies are insects with one pair of wings. Dragonflies, May flies, stone flies, fireflies, caddis flies and the like have two pairs of wings and are not flies. Some flies are useful as scavengers, and some help control destructive insects, but among the lot are most of the carriers of human diseases. The unpleasant habits of mosquitoes, home flies, deer flies, as well as certain gnats and midges, have given these Diptera, or "two-wingers," a bad name.

Black flies, also called buffalo gnats, make life unbearable from May to mid-Summer for loggers, fishermen, campers and vacationers near streams in the resort regions of our northern states, Canada and the mountains. From dawn until dusk, except in bright sunlight, swarms of them fly about your head and get into your eyes, ears, nose and mouth. The females suck blood and inject a poison which raises big welts that itch and ooze for days, usually on the back of your hands and neck. If numerous, these bites can cause headache, fever and nausea.

The adults are stout, humpbacked, short-legged flies scarcely half as long as houseflies. The female dives into a stream and glues several hundred eggs to an underwater stone in rapid water. There the developing larvae use a fringe of finger-like tentacles around the mouth to strain food out of the water. Sometimes a rock is so crowded with these maggots that they look like patches of greenish black moss. After a few days as a pupa, it bobs to the surface, bursts, and a new adult takes wing.

Now, let's take a look at the biting midges.

Sand flies, punkies, or no-see-ums are other names for them. They breed in ponds, streams and tree holes. Their tiny slender larvae swim like miniature snakes. In many places they are a greater nuisance than mosquitoes, because their bite is like a jab with a red-hot needle and they are so small that they can enter dwellings through ordinary screens. Unfortunately, they are most abundant after black flies and mosquitoes have had their season, and in places where the scenery is most beautiful.

Frequently, near lakes or streams, we see great swarms of little insects dancing over the water, or clustered against lighted windows at night. They look like small mosquitoes, the males with large feathery antennae. They sing like mosquitoes, too, but they do not bite. These are true midges. Dozens or even hundreds of species of them breed in fresh water where both the adults and their larvae are a major source of food for almost all kinds of fish. Mature larvae of the different kinds range from a tenth of an inch to over an inch in length and, in color, may be white, yellowish, greenish, blueish, pinkish, or very deep red. The last, known as the "blood worm," is collected and sold in pet shops to feed aquarium fish. It thrives in moderately polluted water.

The young of other gnats and midges are plant pests. The fungus gnats cause "wormy" mushrooms. Others produce rose galls, chrysanthemum galls and the cone galls on willow. The most destructive of these gall midges is the Hessian fly carried to America during the Revolutionary War in straw that the Hessian soldiers brought for bedding. Its annual damage to wheat, rye and barley is estimated at nearly a hundred million dollars.

You can't ignore the naughty gnat or the mighty midge. — *Nature Bulletin*, Forest Preserve District, Cook County, Ill.

Maple syrup pipeline

More maple products producers are going into the use of plastic tubing to collect the sap from their sugar bushes and thus reduce cost and effort during the relatively short sugarin' season.

One operator purchased some 73,000 feet of tubing in addition to hanging 2,000 buckets.

In this mechanical age we can look ahead to a whole sugar bush "plumbed in" with an intricate system of various sized tubing leading into a final 6" line, pressure booster stations and all, pouring a steady stream of sap into an atomic-fired evaporator; thence a syrup line to waiting tank trucks.

It's a far cry from sleds pulled by oxen.

Porky quills

Porcupines force their quills into the flesh of an attacker by a slap of their tails against the enemy; not by Robin Hood archery—despite superstitions to the contrary.

Trout appetites

At temperatures below 40 degrees Fahrenheit trout practically stop digesting their food, they are sluggish and a small fish may satisfy a trout's hunger for several days.

Lake George trails

A new Information Leaflet, "Lake George and Trails in the Lake George Region," is available free from the Division of Conservation Education, N.Y.S. Conservation Department, Albany.

Wildlife gangsters

Conservation Law enforcement officers deal with all types of violators but a Franklin County deer killing by three Malone men this Spring in the vicinity of Slush Pond set a new low for destructionists.

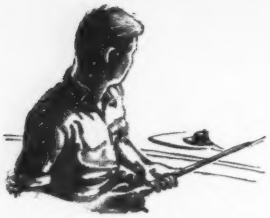
Lloyd Brown, Robert Sancomb and Floyd Myers, all of Malone, were arrested in mid-March this Spring by Game Protector Paul Benoit of the Raybrook District Office for the out-of-season killing of two doe deer in an area where experimental Winter feeding was being carried on.

The violators were first observed on March 8 by two Paul Smiths College students who happened on the trio and discovered evidence of freshly killed deer. The students reported the incident and went back to the scene the next day with Protector Benoit who apprehended the individuals in the act of taking out the hind quarters of the slaughtered animals. On further examination both does were found to have been carrying fawns, one of them twins.

The facts of the case indicated that even after apprehension, threats of violence and retaliation were made by the defendants against Protector Benoit.

After a lengthy trial and ultimate conviction before a Franklin County jury, Judge Ellsworth Lawrence sentenced Lloyd Brown to nine months in the Franklin County jail, Robert Sancomb to four months and William Myers to two months.

We commend the Franklin County jury for its verdict and Judge Lawrence for a sentence that fits the crime.



Letters To the Editor

No lock

Dear Sir: This is in reference to the item "The Saranac Locks," on page 9 of the April-May, 1958 CONSERVATIONIST article entitled, "Boats and Boating."

I did not know that any lock existed between Upper and Middle Saranac. The idea is very interesting. Can you provide more information? For instance, where does one find the entrances, etc?

Donald G. Marshall, Schenectady

• *We threw in an extra lock by mistake—we're sorry to say.*

There is no lock between Upper Saranac and Middle Saranac. Instead, what is known as Bartlett's Carry is between these two bodies of water which limits this stretch to canoe travel. But from James F. Whitelow of Saranac Lake, one of the gentlemen who picked up our error, comes the additional word that the lock between Second Pond and Oseetah Lake has been recently rebuilt and is in very good condition.—Roy Irving

Death on the wire

Gentlemen: Here is a picture taken in the vicinity of Marsh Pond in the Town of Sanford, Broome County. The picture was taken this Spring by Walt Homyak, a member of the Ansco Rod and Gun Club, while participating in the conservation program of restocking trout.

William Butkaucki, Binghamton

Hoax

Dear Sirs: I would like you please to send me a report, if possible, on that strange mutation, the "saber-tooth deer." I would like you to tell me the possibilities of this animal and if it could become dangerous to the wildlife of this State. If it does become dangerous, will there need to be any steps or legislation taken to destroy this species?

This subject was brought to my attention in the 1958, April-May CONSERVATIONIST.

Dave Stewart, Pilot Knob

• *Many years ago, Orson Welles created a near-panic in the land with a radio broadcast of a mock invasion by men from Mars. He forgot to tell the people he was only fooling.*

We know now how it could happen, 'though ours was a small-scale hoax—the sabre-toothed deer, created by A. B. Hatch of Peterboro (see Letters to the Editor, CONSERVATIONIST, April-May, 1958). We indicated that the author was simply having fun.

So, to Dave Stewart and the some twenty others who have written asking what the Conservation Department is going to do about it—nothing. We trust that the beast will vanish into the misty recesses of the Hatch mind from whence it sprang.—Editor

Hand guns

Dear Sir: I would like to know what the law is concerning the use of a revolver for the purpose of hunting big game in the Adirondack Mountains.

I own a Smith & Wesson .44 magnum, with a 6½" barrel. Would it be legal to hunt deer and bear in the Adirondack Mts. with this hand gun?

Joseph P. Sawendowski, Utica

• *Yes—during the open season in the counties where big game may be taken with rifles, deer and bear may be taken during the open season in such counties with pistols or revolvers, except those using rimfire ammunition.*

It is illegal for any person to possess afield an automatic firearm (one which continues to fire as long as trigger is held back) or an autoloading firearm with a capacity of more than a total of six shells, EXCEPT one using .22 rimfire ammunition or a pistol having a barrel length under 8 inches. (An autoloader is a selfloading gun which requires that the trigger be pulled separately for each shot.)—R. J. Vickers, Asst. Superintendent, Law Enforcement

Salmon River salmon

Dear Sirs: Enclosed is a snapshot of a fish that I hope I have correctly identified as an Atlantic Salmon—26¼" long, 13¼" girth, 5½ lbs. on certified scales. It was taken June 6, this year by Harold Robinson of Pulaski. It was taken on a streamer fly with a 3 lb. test leader, near Pineville in the Salmon River, in Oswego County.

The fish had some spawn in it—the eggs were very small. The stomach was empty.

In the enclosed envelope are some scales taken from the fish. I wonder if I can be told the age of the fish. The fish had 2 or 3 lamprey eel marks on it.

Robert H. Brown,
State Game Protector, Pulaski

• *The photograph and scale sample indicate you were definitely correct in identification of this fish as an Atlantic salmon. It is the first one recovered from Lake Ontario from recent planting in New York waters and I am very glad you were able to get full information on it.*

We believe this salmon (26¼", 5½ lbs., 13¼" girth; caught in the Salmon River near Pineville) is a Lake Ontario fish because of the circumstances including growth rate, lamprey marks and location (Pineville is about four miles above Pulaski and could easily be reached by a fish coming up from the lake). It is an exceptionally fast growing salmon as shown by body proportions (small head, small fins) as well as by scale examination.

The age seems to be only 3 Winters; 1956 and 1957 growth being rapid. The 1955 growth and part of 1956 are hatchery type.

On June 22, 1956 a trial plant of 2,250 yearling Atlantic salmon averaging 3½" was made in the Salmon River system at the suggestion of Don Pasko. The scales indicate this salmon could be one of this lot. While it is not possible to completely eliminate possibility it might have been a plant from elsewhere (salmon have also been planted in Cayuga Lake watershed and Fulton Chain),

the scales do not agree with samples I have examined from these other waters.

This particular lot of salmon were the "runts" of some yearlings the larger fish of which were graded out for plantings in lakes and were too small to be considered suitable for direct planting in lakes. This particular salmon, however, may have been one of the largest in the plant and the scales indicate a rapid growth immediately after planting. We have found from previous experiments that some of the larger yearlings migrate soon after planting and evidently this fish did not stay in the stream. This is unusual as the downstream migration of salmon is usually in late April, May and early June. Usually small salmon that do not migrate by early June would stay in the stream another year.

Now that this first salmon caught by Mr. Robinson indicates that some survival of planted Atlantics in the Salmon River can be expected in Lake Ontario and returning to the Salmon River it will be desirable to make every effort to check on other survivals. Chances will be better in 1959, assuming that this fish as mentioned above is one of the earliest migrants (later migrants would be at the present time much smaller).

In view of the present rather limited production of Atlantic salmon in hatcheries it is desirable to evaluate this trial plant in the Salmon River as closely as possible. If more salmon turn up and they show as good a growth rate this would be good news. Also, if or when other salmon turn up I hope we will get scale samples and if possible photographs. We have a supply of CONSERVATIONIST *reprints "Salmon or Trout" and can supply copies to anyone interested as this may help avoid confusion between salmon, rainbow and brown trout.—John R. Greeley, Chief Aquatic Biologist*

Turtle trouble

Dear Sir: While pickerel fishing recently on Watermill Pond on eastern Long Island I noticed something unusual and wonder if you can explain it.

Along the shore I counted at least a dozen water turtle shells. They were all upside down and completely cleaned out of all flesh yet the shells were not damaged at all.

Can you tell me what kind of bird or animal did this?

Ray Allen, Valley Stream

• *Thank you for your letter about the turtles. It sounds to me like it was either the Winter or a raccoon that killed these turtles. This last Winter was a rough one and many ponds that never froze before really closed tight. While a turtle uses very little air during the Winter, they do need some. If the ice cuts off the oxygen and decaying plants in the pond use up what little oxygen there is in the water, then the turtles have had it.*

Sometimes the raccoons will concentrate on a pond and catch and kill quite a number of turtles, particularly if they are a little weak and slow after a hard Winter.—H. Wayne Trimm

"Zeb"

Dear Sir: Last Spring, Forest Ranger Merchant Hutchins, who lives in a little hamlet called Skerry picked up a raccoon that was motherless. The mother had been killed on the highway. Mr. Hutchins took the little raccoon to his home where he and his family raised the animal.

The daughters of Ranger Hutchins named the raccoon, "Zeb." Zeb would run all around the house and would go in and out of the house just like his dog did. Zeb was allowed to be free to go as he pleased. All the neighbors of Ranger Hutchins would feed Zeb. He would rattle a door knob at some of the neighbors' homes until someone would let him in and once given a hand out, he would go out into the woods again.

Last Fall, and this Spring again, Ranger Hutchins would get calls during the middle of the night from people in the area to come and get Zeb out of their homes. Zeb would be in a house attempting to get into a cookie jar or some other container that had sweets.

This story is being submitted to show the public what can happen when a raccoon is picked up and has become domesticated to a point where he has no fear of people. It can cause a great deal of trouble to people.

Again this Spring shortly after trout season had opened, Zeb started again to give people trouble. One day shortly after trout season opened, Ranger Hutchins heard someone hollering for help. Ranger Hutchins ran down the road to the banks of the Little Salmon River and there he saw Zeb attempting to get a trout out of an angler's creel. The angler did not dare to stop the raccoon from taking his trout for fear of getting bitten. But Ranger Hutchins knew how to deal with Zeb and his thefts. It wasn't only a day later when a woman angler had the same experience with Zeb. Ranger Hutchins was getting complaints very often. It seemed that Zeb would live near the stream just waiting for an angler to come along so he could steal another feed of trout.

Ranger Hutchins had to do something after complaints came in each day. Merchant took Zeb up into the Skerry woods to an old friend so Zeb might get into the woods and away from people. But Zeb stayed around this Mr. Kerry's home, slept in the horse barn and would come into Mr. Kerry's house for a hand out.

One day, Merchant and I went up into that country on patrol. We stopped in to see if Zeb had gone away into the woods. But we found Zeb right on hand looking for a hand out. Ranger Hutchins went down to the brook and caught a trout to test Zeb to see if he had forgotten his bad habit. The picture I took proved that he hadn't.

Anyone who plans on angling in the Little Salmon River, near Skerry, need not be too sure of himself. Zeb was taken a number of miles away from the river, but he has been gone for several days from the place where Mr. Hutchins left him several weeks ago. Zeb may be headed back to the river.

Carl F. Prue, Asst. Dist. Game Protector, Malone

Suicides

Dear Editor: I am inclosing a photo of a fish phenomenon, "I think." The fish were found on May 31st in a few inches of water at the shore of our lake front home on Burtis Bay, Chautauqua Lake.

Myron A. Keefe, Jamestown

Who needs it?

Dear Editor: THE CONSERVATIONIST is a very nice little magazine, but who needs it? *Field & Stream, Outdoor Life*, etc. do a good job.

Let's have more fish, more hatcheries, more public stream rights—who needs literature?

L. Cole, Hawthorne

• *L. Cole is our excuse for more musing on the theme. See Editorial, page 1.—Editor*

Lady conservationist

Dear Sirs: I'm interested in conservation. Do you have any man in your company who would let me *board* at their house for a week? Also if I could board, I would love to everyday come to work with him. That way I could learn more about conservation. Some day I'm going to be a lady conservationist.

Judy Huffer, Ft. Edward

• *Now look, young lady, don't you think you're rushing things a bit? Why not finish up your education first; to become a lady conservationist takes a heap of knowledge that you get in books and apply in the field. It would be mighty nice, I'll admit, to board with some one working in conservation and trot along with him on his job but you'd be learning only one special phase of the work.*

Conservation, you know, covers a mighty broad field—not just hunting and fishing and stuff like that but minerals, soil, water, forests and wildlife. A little too much to surround in one week.

You've got to decide, too, in what you'd like to specialize and prepare for it—say fisheries, forestry, or game management—research in any of these. You can get a fine start if you get into Girl Scouting, for instance. Or the 4-H or Future Farmers.

Your interest is commendable but we think you'd better stick to growing up and getting your elementary education first and then—who knows?—Roland B. Miller

Good trapping

Dear Editor: I thought you might be interested in these pictures of bobcats trapped in the Town of Morehouse, Hamilton County. Ralph Remonda trapped these four bobcats in three days last December.

Henry C. Hart, Cold Brook

Pffft!

Dear Sir: For reasons only another nut would understand—I buy old magazines—and this is where you come in. I never heard of THE CONSERVATIONIST until yesterday when I clawed through my most recent accumulation.

If you are still in business, I would like to subscribe from now on. I own a small farm (fifty acres) and would like to know how you people tick. Hunters especially. They shot out two barn windows and air-conditioned the roof. Not all hunters are goons; this I know. I've had some darn nice guys hunting here—and they are welcomed every year. The rest? Pffft!

E. Molly Watling, Appleton

Louisiana heron

Dear Sir: I was very pleased to see in the April-May issue of THE CONSERVATIONIST the color-spread on wading birds of New York. I am proud to say I have seen all but three of the birds portrayed in the plate. Most of them were seen at the Raunt and Jamaica Bay Sanctuary, a wildlife sanctuary supported by the New York City Department of Parks.

Recently a new wader has been seen at the sanctuary which you did not portray. This species was seen during the Summer by many people and was even reported seen this year at the sanctuary. This species is the Louisiana heron.

Also of note, the American egret (common egret A.O.U. checklist) arrived at Jamaica Bay around April 4.

Joel Weintraub, New York City

What's going on?

Gentlemen: Perhaps you could tell me why in a small spring farm pond there are accumulations of what looks like mossy rocks varying in size from 12" to three feet, and on the bottom. Over a period of time they let go from the bottom and come to the surface as just so much scum. A yellow mass of slimy stuff is active over the part of the pond where the springs come in, and it goes on year around. I had one young man from the Department of Agriculture look at it. It was over his head. The local Doctor tells me the water should be analyzed. He is of the opinion it contains minerals of some kind. I would like to know what is going on in that pond?

Joe Mittwright, Stephentown

• *From your description it is clear that this yellow scum in your farm pond is algae and probably some species of filamentous green algae. (Green algae includes a large group of water plants that may vary considerably in color from yellow to dark green.)*

Although sometimes unsightly, green algae is a normal plant growth in many ponds. As to the point you mention concerning mineral content, the presence of algae does not indicate any high concentration of minerals. However, growth is stimulated by fertilizers dissolved from the soil and these include a number of minerals in small amounts.—John R. Greeley, Chief Aquatic Biologist

Frontier

Dear Sir: Enclosed is a one-year subscription to THE CONSERVATIONIST for C. W. Cedarquist, Madrid, Iowa.

You may be interested in knowing that the above gentleman (my uncle) was completely astounded to discover that the Empire State had such "western" items as farms, woods, wild animals, etc. let alone a Conservation Department. I feel that a subscription to your magazine will further his "education" and possibly convince him that New York City does not extend to the Mississippi!

D. O. Cedarquist, East Aurora

"Alley cat"

Dear Sir: I am sending you a picture of a 35-pound bobcat taken April 16 in the City of Amsterdam by Harold Ulcher. Ulcher routed the big cat out from under the rear porch of an Amsterdam residence and shot it from a distance of about 15 feet. Cat was in excellent condition and the trophy aroused considerable interest since people found it hard to believe that a bobcat had been found right in the city.

Arthur K. Robson, Amsterdam

Honey bugs

Dear Sirs: The June-July issue of THE CONSERVATIONIST has just arrived and of all things, an article on honey bees!

That is our favorite subject as we own and operate 600 colonies—a full-time job including shop work during the Winter. Our friend, "Tim" Dyer, sure knows his 'honey bugs' and we are so fortunate to have so talented and friendly a person to lead us on. My compliments to you on this well written article "All About the Honey Bee." For a short story it sure says a lot.

W. Crawford Smith, Clayville

• *In our book, the honey bee is a pretty good conservationist.—Editor*

Trees and Scouts

Gentlemen: Our Scout Troop, Troop 460, Manhattan, would like to do a conservation project on the Scout reservation at Staten Island. In this connection, we would like to obtain a supply of pine seedlings for planting there.

I would like very much to know what arrangements we could make with you to obtain about one hundred pine seedlings for this purpose.

W. C. Lowrey, New York City

• *For several years past, conservation projects have been an important part of Boy Scout and Girl Scout programs. One of the best of these is tree planting. But to do a job here requires more than a little planning and organization.*

The usual source of trees for reforestation is our State nurseries. We sell them for $5 per thousand, F.O.B. nursery at Saratoga or Lowville. They are sold only in lots of 1,000, adequate to plant one acre. And we sell only to people who own the land on which the trees are to be planted and who enter into an agreement with the Department.

Were we to sell directly to those who want to plant trees on another's land, we would lose control over the trees and there would be nothing to prevent their being used for ornamentals, which is against the rule.

The best way for a Scout Troop or similar unit to do a tree-planting job in New York is to make arrangements with some landowner who has trees on order and who might appreciate help in getting them into the ground.

No matter how worthy the cause, it is not possible to get seedlings from the Conservation Department unless the applicant owns the land.

Of course, if you buy trees from a commercial nursery, they can be planted anywhere for any purpose.—David B. Cook, Supervising Forester

Bury the trophy

Dear Sir: Do farmers like woodchuck hunters?

Most hunters shoot woodchucks and leave them in the field or hang them on a fence. Our dogs bring them in when they get ripe and we have to bury them. They also roll in them. I would like to see a law that would require hunters to take their kills home or bury them. I have to bury two or three a week.

LeRoy Whitcomb, Richfield Springs

• *Chuck hunters don't really need to hang their trophies up to prove their marksmanship—and they will have more landowner friends, if they don't.—Editor*

To the point

Dear Editor: Re: April-May issue of THE CONSERVATIONIST To: Gil. Russel Bracket for his very apt, "The Game Warden's Lament."

Thank you!!

A Game Protector's Wife

• *You're welcome.—Editor*

Pet partridge

Dear Sirs: George Bisbo of Constantia has been hauling gravel out of the woods for two summers and everytime he starts his tractor a hen partridge (ruffed grouse) comes running out of the brush to follow his tractor and pick up worms.

The last few trips she will run up to him and permit him to pick her up and stroke her.

I have never heard of a grouse becoming as tame as a chicken.

Howard Ballway, Constantia

• *Occasionally a grouse will confuse the sound of an operating gasoline engine with the drumming "thump-thump-thump" of another grouse.—Editor*

U.H.F. squirrels

Dear Sir: On page 45 of the April-May 1958 issue you give advice on helping to discourage squirrels from taking over bird houses. Last Winter I believe I solved the squirrel problem with a discarded TV antenna and a little auto grease.

All I wanted to do was to see that the chickadees got some chunk peanut butter, which they like and which the squirrels like better. After watching "impossible" acrobatics on wire devices I had set up, an idea struck me. Using an antenna, length 12', diameter 1" placed in ground three to four feet deep and daubing some grease (pressure gun lubricant) three to four feet above the ground for a distance of two feet or more, the critters only got headaches surveying the situation.

Could very well be used for bird houses too by inserting wood plug in the end. I'm for the birds.

Maurice H. Skillman, Riverdale

• *Thanks for your letter and for the information on how to discourage squirrels. I can just see a squirrel sliding down a greased antenna! We're for the birds — and the squirrels too—one group at a time, though.*

I really think your idea is a good one.—H. Wayne Trimm

Pheasant situation

Dear Sirs: I would like to give you some of my observations on the game situation in Columbia County.

Last August and September there were plenty of birds but just before the hunting season they seemed to disappear for some unknown reason. Very few birds in this locality were killed after the first few days. I have heard from hunters that three weeks is too long a season on pheasants. However, I do not go along with this because unless a man has a real good dog, very few birds will be taken after the first few days.

The pheasant situation after this past Winter does not look too good. There appears to be very few birds. Hens included.

I would appreciate any comment your Department will make in regard to the "pheasant situation."

James I. Coons, Germantown

• *We agree that pheasant production in Columbia County last year was at least as good as average; perhaps a bit better. We also agree that a somewhat unusual shuffle took place last Summer and that the hunting take was lower than expected. In my opinion, both the shuffle and the reduced hunting take were direct results of the hot, dry weather.*

Pheasants require quite a bit of water each day but, normally, Summer needs may be supplied by dew and by the insects taken at that season. The long period of dew-free days that occurred in the mid-Hudson Valley last year forced many pheasants to move closer to a supply of free water.

Since many of the smaller swales and marshes dried up before the Summer ended, large blocks of the area were devoid of pheasants at the start of the hunting season.

During much of the hunting season, a bird dog was of little help except as a retriever. On most days, the scent lasted only a short time and the dog would last only a little longer. On the other hand, most of those who were able to get out, with a good dog, on the last few days of the season, had little difficulty in taking their limit by mid-morning.

In spite of the severe Winter of '57-58 it appears that we did have a substantial carry over of pheasants. The actual hunting prospects will depend on this year's production. Young birds usually make up at least ¾ of the pheasant bag. — Charles Mason, Game Research Investigator

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Credits

First cover, second cover, centerspread, pages 24, 25, 28, H. Wayne Trimm; 2, 10, 11, Division of Parks; 4, LeRoy C. Stegeman; 7, 17, 18, 19, Roy Irving; 13, Nick Drahos; 14, 15, Dwight A. Webster; 20, 21, F. L. Gambrell; 30, 31, Art Cook; 32, 33, Bill Roden; 34, Bernard Henry; 35, 38, Earl McGuirk; 37, Jos. Dell, Thos. Leonard; 39, Bill Taubman; 41, George Odell; 42, Watertown Times, Dr. John R. Greeley; 43, Adirondack Enterprise; third cover, Clayt Seagears; fourth cover, P. W. Kruetzfeldt.

The Inside On The Outdoor Series

Research Reaches the Redhead

TIMMY MOSS was ten and conscious of two things: His hair which was sensationally red, and Betsy Barnes who was sensationally golden.

Timmy lived in a long, cool valley where his father worked at a big New York State trout hatchery. Five miles away was the village where Betsy lived. Whitey Amos lived there, too. He was a good looking, aggressive tow-head who was Betsy's beau and a poet. One of his verses was in wide use among the fifth-graders:

"Timmy Moss, Timmy Moss, dipped his head in spaghetti sauce"—

* * *

The probability that there should exist any relationship between the color of a boy's hair and the quality and quantity of light entering a trout's eye—or a weasel's—normally should be considered ridiculous. However, that is the gimmick upon which this story is based. If you do not believe it all happened precisely as it is here set forth, we will not be at all surprised.

* * *

A very large number of yearling brown and brook trout are stocked in New York's waters as early as possible each Spring. This makes room in the rearing ponds at the State hatcheries for millions of fingerling fish which have outgrown the big batteries of long, shallow troughs where they were hatched several months previously. The yearlings thus dispossessed normally are not yet seven inches long (the minimum legal catching length) by early April when the trout season opens. Although these undersize fish may not yet legally be taken, many insist on swallowing the hook just the same. And this, of course, is conservation gone haywire. For about 70 years in New York nothing could be done about it simply because the love-life of brook and brown trout is geared for the spawning of eggs around mid-October.

It had long been thought that increasingly cold weather made snowshoe rabbits, for example, turn from Summer brown to Winter white or caused mink to don their luxurious warm pelts. Not so. Controlled lighting could produce the change at any time of year. Even tough old Billy goats, which breed in the Autumn, got kittenish in the Spring at the scientific flick of a light switch.

After much experimentation, the Conservation Department had successfully stimulated its game farm pheasant breeders into the laying of eggs far ahead of normal schedule. This resulted in enormous saving. Game farm pheasants normally string their production of about 70 eggs per hen along into July. Chicks hatched from such late eggs are so young when Winter comes that survival prospects are dimmed. So a month's forward shift in the laying period changed the whole picture.

This was accomplished simply by fooling the sex mechanism of the birds by simulating the increasingly longer and stronger daylight hours of oncoming Spring with carefully controlled flood lights over the outdoor breeding pens.

If the biological and physiological behavior of birds and mammals could be changed by the artful stimulation of artificial light, why not trout? So in 1950 the Conservation Department began to experiment.

It's easy to produce artificially the advent of Spring for critters that breed that time of year. All you have to do is to lengthen increasingly the daylight hours with artificial lights. But it's more difficult to produce the coming of Winter for Fall breders—like brook and brown trout—because that means a progressively *decreased* intensity and duration of light. The whole job has to be done under cover from artificial dawn to dark. So four rectangular breeding ponds at the Randolph hatchery were roofed over like covered wagons. Inside, the waning light of the phony Fall arrived two months ahead of the sun's normal working schedule for New York—and the trout never knew the difference. They spawned! The eggs were normal in all respects and for the first time two Springs later the resultant "yearlings" were all of legal size when stocked. That made everybody happy—including fishermen who never suspected all that advance legerdemain with the lights.

By 1958, the eggs-ahead program was in full blast at the hatcheries.

* * *

It so happened that under the roofs of these artificially lighted trout ponds a weasel took up full-time housekeeping. Like all New York weasels in Spring, it had changed from ermine-white to brown. But by and by the dimming lights of his strange home affected him, too. By August, his coat had changed to white again!

By then, the red-haired Timmy found his love-life rougher than ever. A motion picture concern, specializing in short features, had planned to shoot a trout-fishing picture along a famous nearby stream. Its advance man, looking for suitable sites and actor-fishermen, had tagged Whitey as the typical American-boy type for use in one of the sequences. Timmy's tow-headed rival (Note to proofreader: NOT two-headed) naturally got a front seat in Betsy's youthful affections. He became even more self-confident. Again he turned on the poet's muse and all the human little sheep in the village took up the chant:

"Timmy Moss is a bad papoose; he wets his hair with tomato juice."

Naturally, Timmy was heartsick. He pondered dyeing his hair. Finally came the August day when the movie crew was to shoot the picture—and with Whitey as one of the main props. It was too much for Timmy. He made the great decision. He'd buy some peroxide and bleach his hair. So early that morning he walked out along the hatchery ponds to the road to await the regular passage of a milk truck for a lift to town.

He sat down on a pond bank. There he watched a brown weasel run along a nearby pond bank and disappear near the mouth of an outlet pipe. In a moment Timmy saw the weasel jump from the other end of the pipe into the ferns. But now the brown weasel was *white!*

Timmy was amazed. He never suspected that *two* weasels were involved. His thoughts raced. Something those research men put in the water must have bleached the animal instantly. The truck went by but he paid no heed. He ran to the pipe and let the water run through his hair. Then he raced home. The tears welled when he looked in the mirror "—wets his hair with tomato juice."

When Timmy was especially despondent, he did what many people do: He went fishing. And, as you might suspect, he happened to choose the place where a couple of station wagons soon unloaded assorted cinematic paraphernalia and personnel—including Whitey. Nor will it surprise anyone to disclose that the film's director immediately fell in love with the photogenic brilliance of Timmy's hair and insisted on using him—as well as Whitey—for variously posed shots of the perennial fishing picture favorite: The barefoot boy and the alder pole.

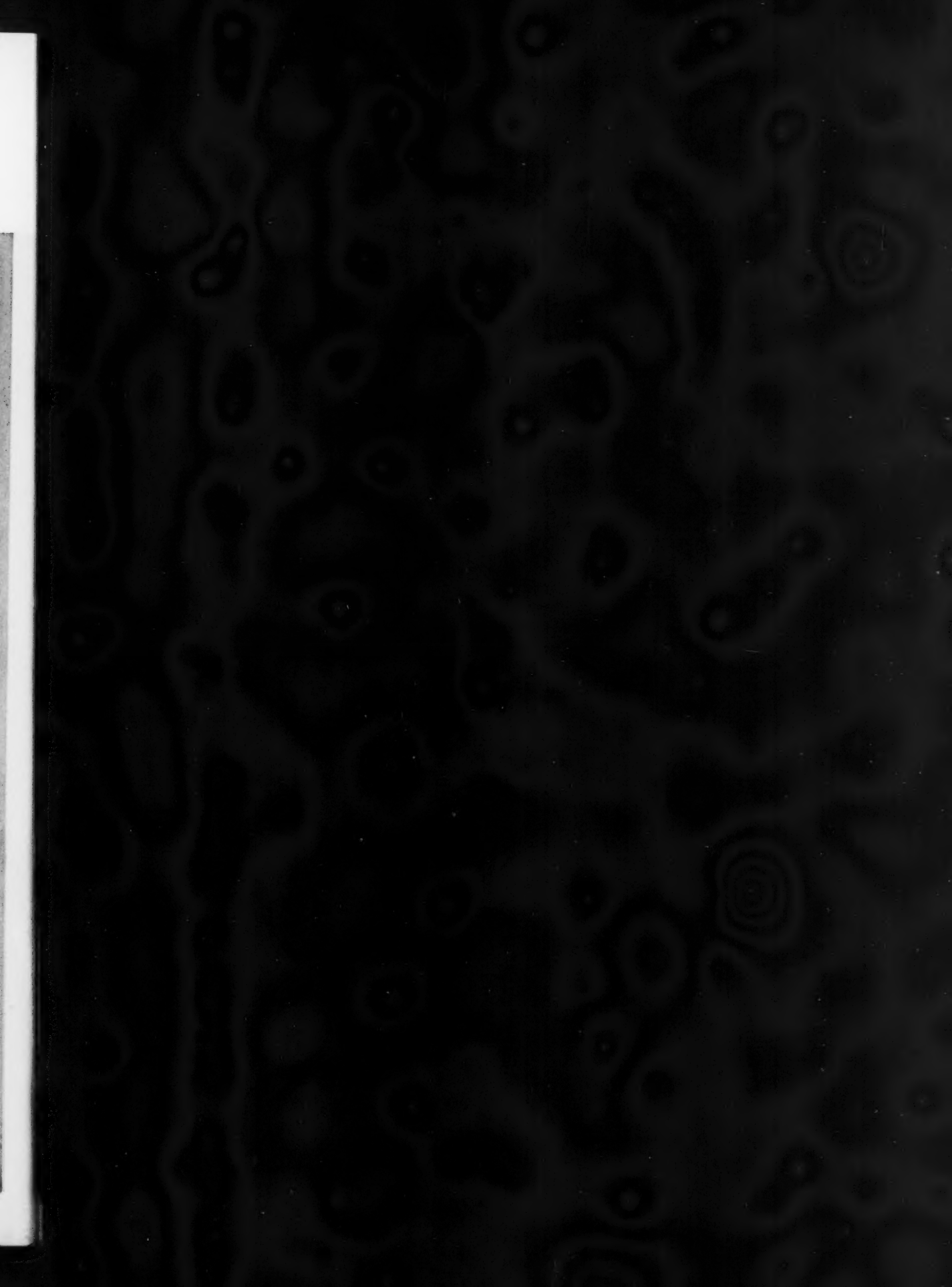
Whitey and Betsy sat in front of Timmy that Winter night when the film came to town. Even its title faded into the bright sunset of Timmy's thatch. Whitey never once appeared.

Betsy may have been only ten but she knew a good man when she saw one. She moved back and sat next to her happy redheaded hero.

Of course the boy had not the slightest idea of the part that those manipulated lights had played in this sudden blissful state.

If he had, he probably would have blown a fuse right there.

—CLAYT SEAGEARS

"Timmy saw the weasel jump from the outlet pipe into the ferns"

A SUMMER BOUQUET